THE MODEL ENGINEER

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SEPTEMBER 30th 1954

Vol. 111 No. 2784

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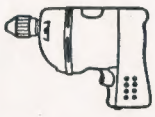

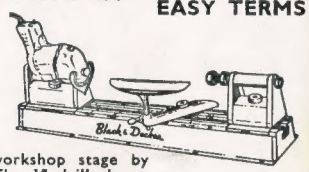

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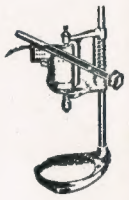

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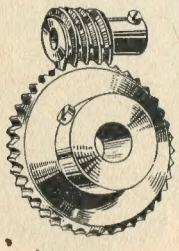

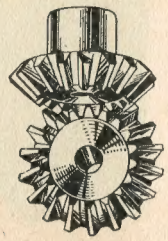

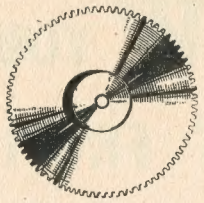

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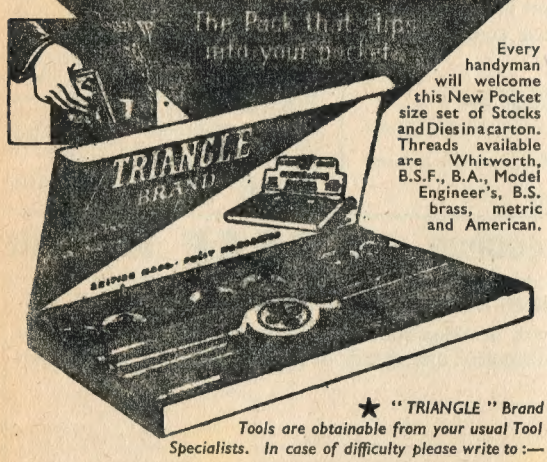

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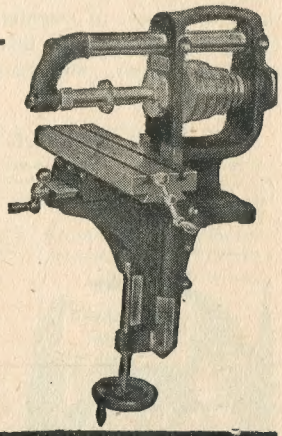

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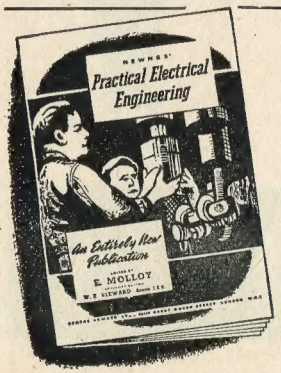

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THE
MODEL ENGINEER

EVERY THURSDAY

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OUR COVER PICTURE

This photograph, taken at the M.P.B.A. Grand Regatta at Victoria Park, London, E., which is fully reported in this issue, shows Mr. D. Careless, of the Portsmouth Club, starting his boat in the Steering Competition. The scene is typical of the many inter-club events which are held during the season, culminating in the above regatta, in which clubs from all over the country take part. Despite the unfavourable weather encountered during this summer, the popularity of model boats has not declined ; on the contrary, more competitors and spectators than ever have attended regattas, and more than 100 boats in the prototype classes, not to mention many others in racing classes, took part in the Grand Regatta. Now that the season is drawing to its close, model power boat enthusiasts will be turning their attention to the production of new and better boats during the winter, many of which no doubt will make their appearance next spring.

SMOKE RINGS

Affiliations and Federations

IN VIEW of the number of enquiries we receive for information about the various model engineering associations and federations in Britain, the following list may be useful and, so far as is known, is complete:—

The Northern Association of Model Engineers, hon. sec., J. H. Williams, 154, Park Road, Timperley, Cheshire.

The Southern Federation of Model Engineers, hon. sec., R. A. Read, 90, Woodside Road, Salisbury, Wilts.

The South Wales and Monmouthshire Federation of Model Clubs and Societies, hon. sec., R. S. Page, 11, Twyn-y-Tedwen Road, Gabalfa, Cardiff, Glam.

The West Midland Federation of Model-Making Societies, hon. sec., J. E. Guy, 21, Kenwood Road, Birmingham 9.

The S.M.E.E. Affiliation East Midland Branch, hon. sec., S. L. Redshaw, 191, Harrowby Lane, Grantham, Lincs.

The S.M.E.E. Affiliation, hon. sec., J. W. Reed, 185, Windmill Road, Hemel Hempstead, Herts.

Lost—and Found !

WE HAVE received from the Borough Engineer, Leamington Spa, a complete set of "M.E." blue prints for an "L.B.S.C." locomotive which were found in Holly Walk on Tuesday, September 7th. If the loser will communicate with us, giving the identification of these prints, we will return them to him, and we take this opportunity of thanking the finder for the trouble he has taken in this matter.

Another 5-in. Gauge Electric Loco

THE PUBLICATION of the description of Mr. S. B. Whitmore's 5-in. gauge electric locomotive (THE MODEL ENGINEER, August 5th last) has brought us an interesting letter from Mr. C. E. Hooker, of Maidstone, who built a 5-in. gauge electric locomotive for himself in 1952. This engine was referred to by Mr. R. R. Turner, in a letter published in our issue for July 23rd, 1953. Mr. Hooker tells us that his engine has now hauled thousands of adults and children at local fetes and shows, and has given every satisfaction. It runs well in all weathers, and no adjustments whatever have been required since the construction was completed.

The locomotive operates on 24 volt d.c., obtained from a storage battery, a generator, or rectified a.c., and is remotely controlled. So far as is known, it is the only remote-controlled passenger hauling miniature railway in existence. The usual train is two 4-seater, ball-bearing trolleys, and current consumption varies from 7 to 12 amperes; the speed is 4 m.p.h. We hope to publish, later on, an illustrated description of Mr. Hooker's interesting locomotive.

A New Loco Track

IN 1951 the South Durham Small Locomotive Society thought up the idea of building a passenger-carriyng track in Bishop Auckland. Contact was made with the local Urban District Council soliciting its help. The council was enthusiastic over the project and backed it with gusto. In consequence a track of 1,170 ft. has recently been laid on a site near to the Council's Woodhouse Close estate.

This track is not yet complete and it is not expected that it will be officially opened before next year. In spite of this, however, the South Durham Society has been running trains regularly since August of this year.

That the new railway is proving a first-class attraction to the children on the housing estate goes without saying.

Clubs in New Zealand

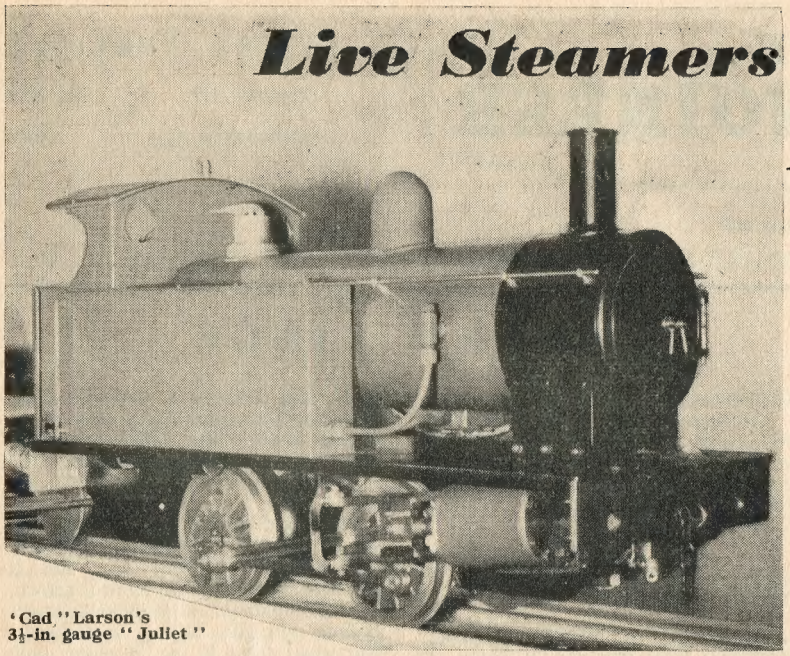
MR. J. E. ROBINSON, Hon. Secretary of the Marlborough Society of Model and Experimental Engineers, in Blenheim, New Zealand, has been engaged recently in making extensive enquiries with a view to compiling a complete list of similar societies in New Zealand. To date, he has discovered as many as eight, other than his own, which gives some indication that our hobby is very much alive in that far-off land.

Some of these societies are affiliated to the S.M.E.E. Affiliation, which shows that mutual help and friendship extend far beyond the shores of Great Britain.

Live Steamers in the New World

BRITISH MODEL ENGINEERING INFLUENCE IN MINNEAPOLIS

By Wilbur Chapman



'Cad" Larson's 3½-in. gauge "Juliet"

IF you Londoners will take the "Water Bus" down to Greenwich, then follow your meridian by train and boat to the French city of Bordeaux, you come to the 45th parallel. Then board a plane and fly due west about 4,500 miles, to the 90th meridian or a few miles past, and you will come pretty close to the north-east corner of Minneapolis. We claim nothing unusual for our end of town, except that four fellow "Live Steamers" happen to live within a half-mile radius of each other.

Their names are: Messrs. John Erickson, Cadwalder Larson, Bill Goesch and yours truly, Bill Chapman. We all follow latest events in THE MODEL ENGINEER, either by private subscription or at the public library. And we are all disciples of that beloved "Doctor of Locomotives, Big Small or Compound"—due apologies to the London, Brighton & South Coast Railroad people. Needless to say "L.B.S.C." is the final authority on locomotives, with all their accessories, and we all have followed his "words and music" with excellent results. A brief sketch of each man and his project follows, which it is hoped will prove interesting to Britishers and Yankees alike.

We will start with Mr. Cadwalder Larson—otherwise known as "Cad." He is the youngest member of our "quartette," has the best equipped shop, and the most models to his credit. "Cad" has finished a fine model of *Juliet*, a 3½-in. gauge 0-4-0 tank locomotive of "L.B.S.C.'s" popular design. This engine has axle pump, injector, lubricator, steam gauge, whistle and valve-gear, all working perfectly, just as the Doctor ordered. The pictures, however, do not do this job justice.

The amazing feature of this engine is its hauling power on low pressure. It will pull its builder or even myself—225 lb. weight—on only ten pounds of air pressure.

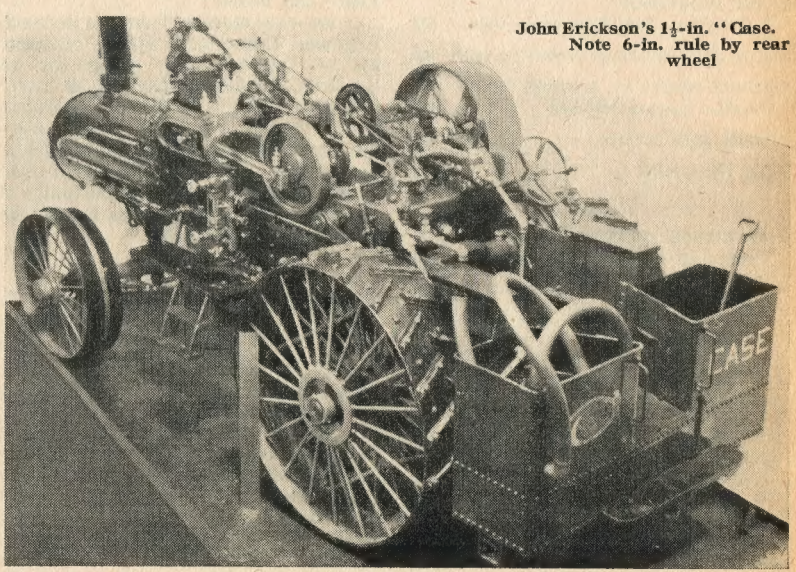
Even with this low pressure of ten pounds, one must handle the throttle carefully to avoid spinning the drivers. Both good design and workmanship are evident. Next is a small traction engine, spirit fired, with cylinder and valve design according to "L.B.S.C.'s" plans for *Mollyette*. The engine will idle very slowly or rev. up to about 4,000 without vibration. Valve-gear is the "Wolf" type, similar to the Hackworth in your country. Steam consumption is very low, and the engine will run 40 min. on one filling of water and spirit.

Two Lathes!

"Cad" has two lathes—lucky fellow!—one large and a smaller one for brass work. He made a collet for $\frac{5}{16}$ in. square brass rod used in making small injectors of the good Doctor's type. In addition, he has a nice 7-in. shaper and a two-speed band saw for both metal or wood. These, along with a drill press and brazing torch, make his shop the best equipped of us all.

Not the least of his achievements has been "selling" Mrs. Larson and daughter Marilyn on locomotives. Whenever we gather in the shop for a "jam session," Mrs. Larson always brings down a tray of tea and delicacies. Locomotive salt shakers, book ends, flower pots, and old prints adorn the home warming the heart of all old railroaders.

Only once did "Cad" "jump the



John Erickson's 1½-in. "Case. Note 6-in. rule by rear wheel

track." Last winter he couldn't wait for warm weather to try out a new kind of coal in *Juliet*. So he fired her up, down in the basement while Mrs. L. was gone. The resulting soot and smell put "Cad" in the doghouse for a week. Or would you say "Roundhouse" Mr. Editor! Oh yes, *Juliet* ran fine!

At the moment, "Cad" is building a 2½-in. gauge Pacific from a set of castings purchased from Bond's last fall. This is a beautiful set of parts and the progress made astounds us all. Such features as axleboxes made of extruded brass to fit pressed hornblocks, full size detail drawings, etc., make this a pleasure to build. We all sighed and agreed: "if only we'd had a set like this for our first engine"!

The next member of our "quartette" is John Erickson—namesake of an important inventor in American history. John was raised on the farm, and learned to love and run steam engines at an early age. After coming to Minneapolis, he started building a stationary engine, complete with force feed lubricator, flyball governor, and throttle. The boiler is gas-fired from the city lines. This model is finished in "bright metal"—a finish which shows up flaws and defects, as we all know. The flyball governor gave a little trouble from hunting at first, but a small dashpot corrected that annoying condition. But with an old traction engine as his "first love," John could not resist trying his hand at a 1½-in. scale model of a 60 h.p. Case traction engine. So nearly ten years of spare time were spent in the building of the finest traction engine model we have ever seen. Unable to get castings in this scale, John had to make his own patterns, and then locate a foundry which would bother to make such small castings. John is a perfectionist at heart, so it is doubtful if the Case people ever put the same loving care and devotion into their engines as he did. About the only purchased fitting is the steam gauge from Messrs. Bassett-Lowke. He has tried an injector of "L.B.S.C.'s" type, which worked very well. However, the original engine had a vertical type injector rather than horizontal. So far he has been unable to get a vertical job of "Penberthy" style to work well. One trouble is the hard water we have in this vicinity.

Of course, the engine also has a gear-driven plunger pump which takes care of the boiler feed. An expanding shoe type clutch in the flywheel connects engine to drive wheels. The flyball governor controls engine speed very closely. Again it was necessary to install a dashpot to prevent "hunting" of the governor. When running idle, the exhaust is very quiet, but as soon as a load comes on, the engine "barks" in a most approved manner. The diminutive whistle gives a high pitched shriek, reminding one of a mosquito convention. An ejector and hose are included to fill the water tank from an outside supply. In contrast to his stationary engine, John has painted the Case in its original factory colours. Wheel spokes are red with dark blue tread, engine in green with bright brass trim, boiler and stack painted black. A picture of the Case factory appears on the back of the water tank. This job won first prize at our state fair two years ago, and arouses admiration wherever it is shown.

At present, John is building a Bolsover type boiler for a small Shipman engine, popular in this country fifty years ago. Plans for this boiler appeared in THE MODEL ENGINEER some years ago. He plans to install this job in a boat, so that he can go quietly and reliably on fishing trips. The Shipman engine is about two feet high, 2½-in. × 2½-in. cylinder, with pump and reverse gear. Strictly speaking, of course, this is not a "model" if you define a model as a small imitation of the real thing. However, if sufficient interest develops, more about results will appear later.

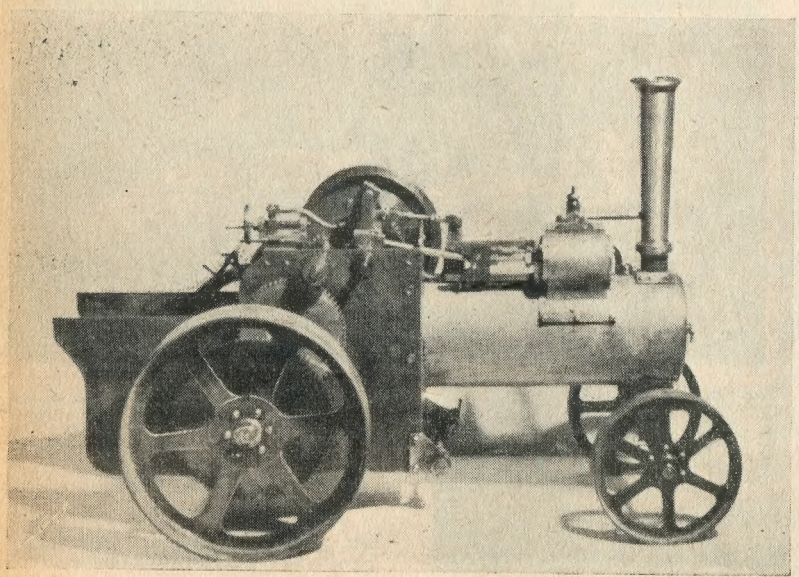
Bill Goesch is the third man in our "tribe." (The "o" rhymes with goat.) He is foreman of the local Westinghouse repair shop here, so is good at handling heavy equipment. His background of experience comes in handy in building a ½-in. scale "Standard Engine" of the type so widely used during the last half of the 19th century. In fact, this is the kind of locomotive that helped to build the U.S.A. When the Founding Fathers of this land first looked across its broad plains, they guessed it would take a thousand years to civilise and populate it. (Many of these men were from Merrie England.) Thanks to the locomotive—your invention—the job was done in forty years. So Bill has good reason to build a model of what is certainly the most important single factor in building our country.

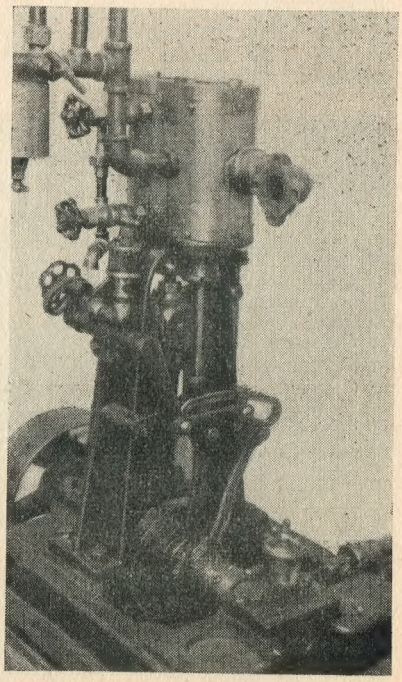
As work progressed on this engine, he realised that a milling machine would help greatly in finishing many parts, so he took time out to take a kit of parts and build a very neat machine. With this completed, he is ready to tackle the engine again with renewed vigour.

(To be continued)

Right: John Erickson's "Shipman" engine, 2½ in. × 2½ in. cylinder

Below: "Cad" Larson's traction engine





Model Power Boat News

BY MERIDIAN

Mr. B. Stalham (Kings Lynn) with his vee twin engined boat "Tha III"

THE GRAND REGATTA

THE 1954 Grand Regatta of the M.P.B.A., held recently at Victoria Park, London, again proved a remarkable occasion. The very large attendances seen in previous "Grands" were again exceeded, and for the first time ever, the entry of straight running boats reached the century mark. In addition, there were around 50 hydroplanes contesting the speed events, to make up a wonderful day of model power boat activity.

The weather conditions, for a change, were fairly good—a dry day, but with a breeze blowing down the lake which made matters a little tricky for both straight running and speed craft. Thanks to the co-operation of the competitors, many of whom arrived at the lakeside before 10.0 a.m., the regatta was well under way by 10.30 a.m. and continued without a break until just after 6.0 p.m., when the prizes were distributed. The spectators, who arrived in large numbers and stayed all day, were kept entertained with hardly a break—the longest gap between events was no more than a few minutes !

Straight Events

In addition to the Nomination and Steering events, the Grand Regatta is the occasion for the award of the "M.E." Prototype Cup, and the judging for this is partly done during the other straight events, since performance is taken into consideration as well as appearance.

The conditions for this event lay down that boats having won the trophy once are ineligible, so that many of the fine prototype craft seen at the regatta came into this category. This eases the task of the judges a little, but with such large numbers of craft, the judging is still very difficult.

The judges this year were E. Bowness and R. O. Porter, and their eventual choice was the fine police inspector's launch *Sir Robert Peel*, by P. Petch of the Bromley Club. Incidentally, this boat was in the competition section of the "M.E." Exhibition, where it gained a Silver Medal.

As usual in the Grand Regatta, the precision in estimating time had to be very close to stand a chance in the Nomination Race, and the winner—

Mr. Newcombe (Victoria) and Mr. Slender (Welling) in the steering competition

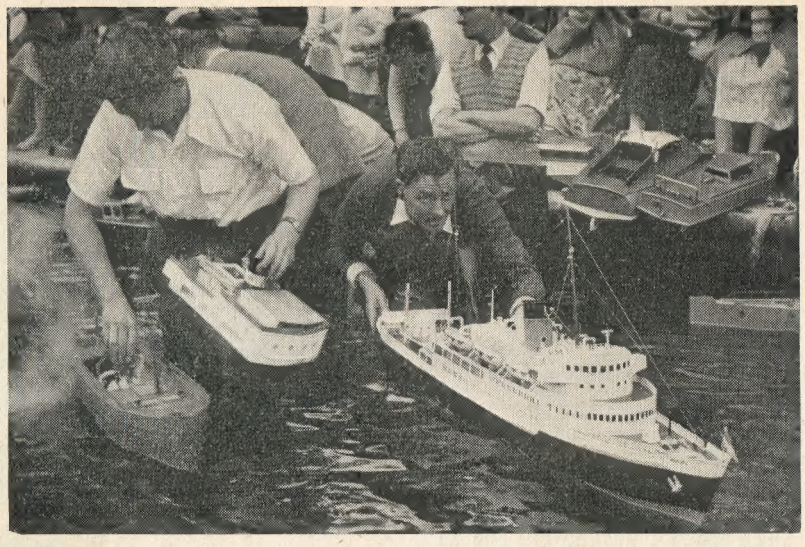
Left: Mr. W. Blaney's "Lil" Man the only boat with a pilot

A. Rayman (Blackheath) actually returned a correct nomination with his steam launch *Yvette*. The next two competitors with the least error were E. Vanner (Victoria), and W. Hayward (Southend), both with 0.2 sec. error, but the percentage error was less in the case of Mr. Hayward, which took him to second place.

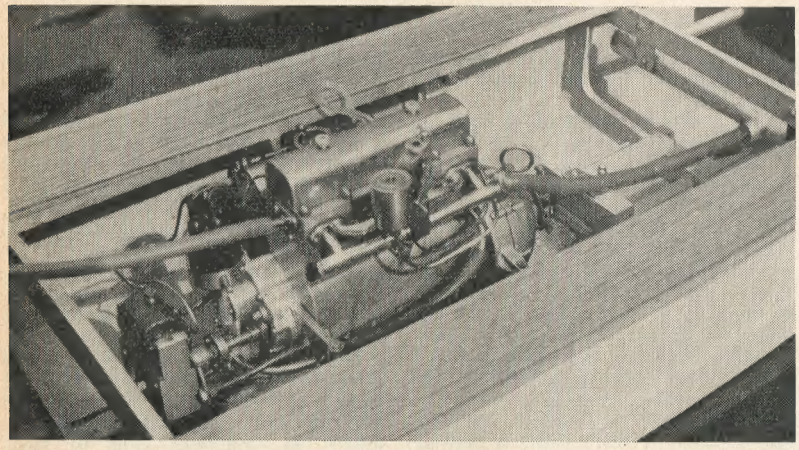
The method of timing Nomination events from the starting end of the course is an immense improvement on the old way, and it is possible to run two boats over the course at the same time, provided that sufficient stopwatches and officials are available.

This method has been in use several years now, and it certainly proves its worth at this regatta, where it is so essential to avoid delays wherever possible.

The Steering Competition for the M.P.B.A. Trophy was a demonstration of what can be achieved with good co-operation. Except at the tail end of



Mr. Wilson (Portsmouth) with liner "Mercuri"



This excellent four-cylinder o.h.c. engine with magneto ignition, was built by Mr. Washington and fitted to Mr. Bunker's boat (Forest Gate)

Right: One of the hardy annuals, Mr. R. O. Porter's "Slickery," which has appeared at nearly every regatta since the '20's

the event, there was not a break in the procession of boats making their way to the targets (or thereabouts !). The scene at the start was an amazing one, with dozens of boats, their engines revving, waiting their turn to go.

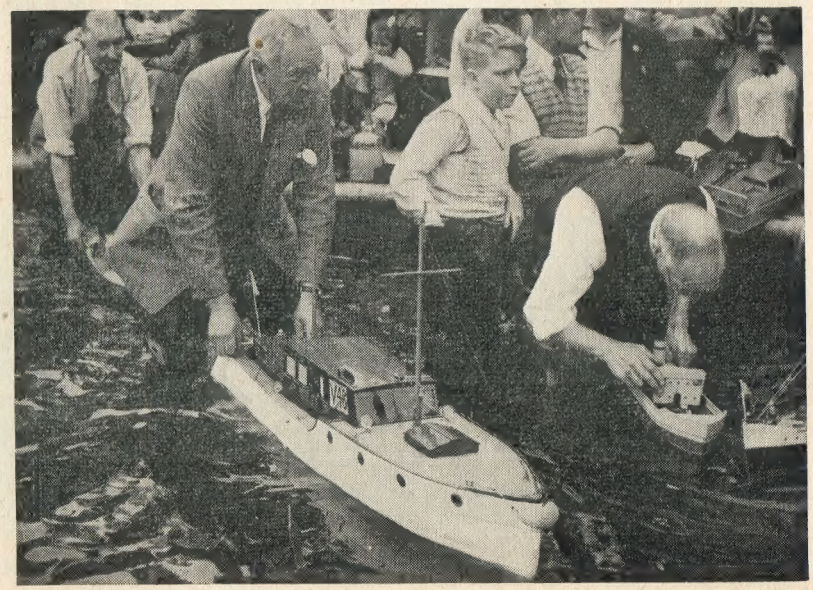
The course set was a difficult one, and was about 65 yd. in length, combined with fairly narrow gaps between flags. This, of course, made for fairly low scoring, but the holder of the trophy, A. Squire (Kingsmere), with *Comet III*, was not at all deterred, and scored 13 points for the best score of the day, thus retaining the trophy. This is one of the few occasions that this feat has been achieved. Second in the event was F. Holme (Blackheath) with 10 points, and a tie for third and fourth places could not be decided by re-runs, owing to lamp trouble of Mr. Loe's (St. Albans) steam boat. The other competitor involved in the tie was R. Curtis (Victoria) and the third place was, therefore, decided by the toss of a coin.

Speed Events

With scores of pairs of waders stirring up the water—not to mention all the straight running boats—speeds at the Grand Regatta are never in the record-breaking class. Nevertheless, some extremely good performances were recorded, with the winning speeds in all races over the 50 m.p.h.

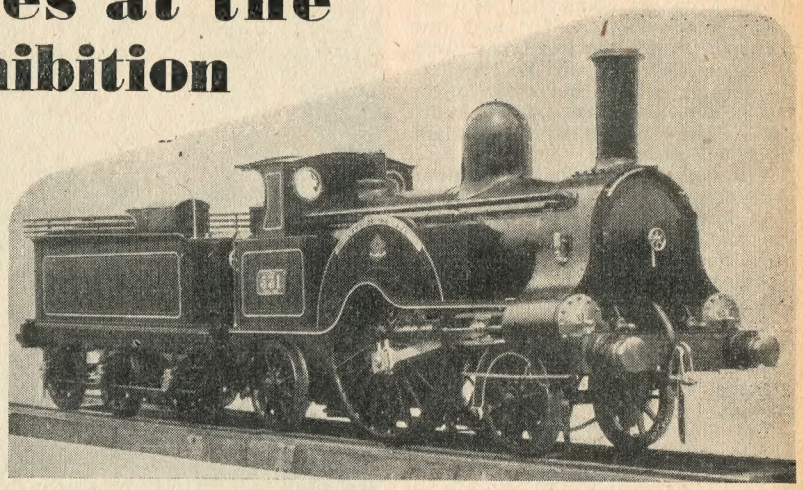
Spectators had thrills in plenty—mostly provided by the two Class "A" flash steamers entered. B. Pilliner's *Eega Beva* was one of these, and attained

(*Continued on page* 391)



Locomotives at the "M.E." Exhibition

By J. N. Maskelyne, A.I.Loco.E.



Mr. H. C. Powell's 2-in. scale L.N.W.R. 2-2-2 engine, "Lady of the Lake," winner of the Championship Cup

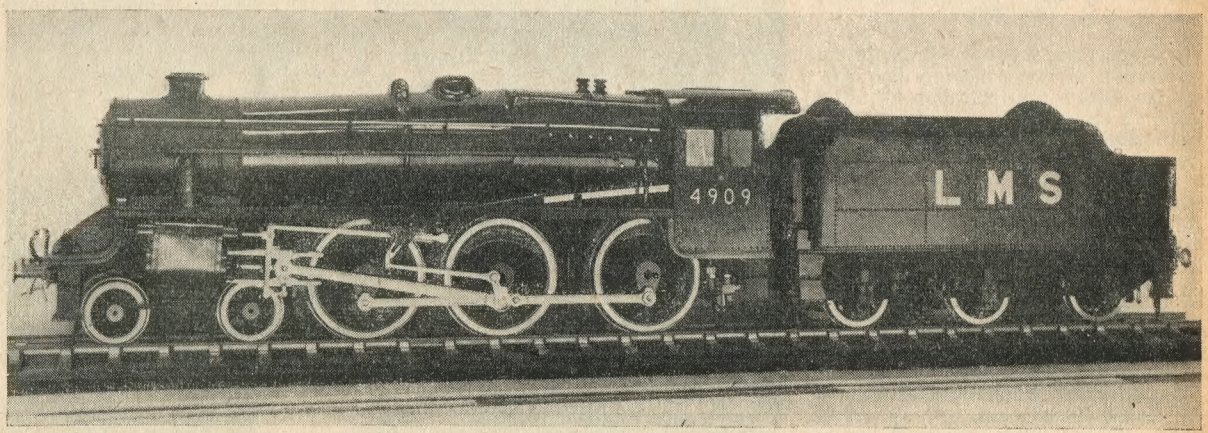
THE exhibits in the "Locomotive" sections of the 1954 "M.E." Exhibition, Classes "A" and "B," must have heartened all those of us who were disappointed last year. There were eleven entries in Class "A," this year; each of them won an award, and thoroughly deserved it. This is not to say they were all of the same general quality, but rather that each had its merits and demerits, the dissimilarity of which added a great deal of interest to them all. The totals of marks scored varied from 310 to 390, which is a more limited range than has been noted at the "M.E." Exhibition for some years.

In this brief commentary, I am dealing with the engines in catalogue order, as usual, and I am hoping that the photographs I have been able to include shall speak for themselves.

No. 1 was a 3½-in. gauge L.M.S.R. 4-6-0 "Class 5MT" engine by Mr. H. W. Gurney, of Harrow. Based on "L.B.S.C.'s" *Doris*, this engine embodied several minor alterations and a good deal of added detail, as a result of careful observation of the prototype. Mr. Gurney had occupied six years on its building, and without any proper workshop facilities, most of the work being done in the kitchen of his home. I was rather surprised to notice that, in spite of the care that had been taken to make this engine look right, no attempt had been made to reproduce or imitate the characteristic guides for the valve-rods; I do not think that they would be beyond Mr. Gurney's obvious skill and patience, and I am sure that they would not be too difficult to fabricate. However, this nice engine won a Silver Medal.

No. 2 may be said to have been the outstanding attraction in Class "A." It was Mr. H. C. Powell's 2-in. scale L.N.W.R. 2-2-2 engine, *Lady of the Lake*, the sheer size and delightful old-world character of which acted like a powerful magnet on all visitors. For me, it awakened many memories, though I have clear recollections of only six of the sixty prototype engines, the last one seen by me being in 1907. Mr. Powell's replica is beautifully accurate in outline and general proportions; the whole character of the lovely prototypes has been most successfully captured, and I doubt if there exists a *working* replica of any locomotive, in any scale, that is more "true-to-life" than this one is. Even so, it possesses a number of minor features which suggest that Crewe has forgotten some of its former practice! I have neither time nor space to allow of my mentioning them now; but I will try to do so at a later date, because no fewer than four L.N.W.R. enthusiasts noticed the same errors that I did. I am not blaming Mr. Powell, however; he was frank and informative on his entry-form, and in a brief talk I had with him when he was at the hall, on the first Saturday of the show. He was not responsible for some of the work on his engine; but after all allowances had been made, he scored 390 out of a possible 450 marks, and that won him the Championship Cup.

No. 3 was another reminder of old times, a G.N.R. Stirling 8-ft. single by Mr. G. O. Blomquist of Hendon, and a very nice one, too. It represented the engine as originally built in 1870, hence there were several points of difference between it and the full-size engine which is now in York museum. Mr. Blomquist's workmanship is good, and he has a good eye for proportion. The painting, more especially the lining,



Mr. H. W. Gurney's 3½-in. gauge L.M.S. Class 5 engine, built mostly on the kitchen table

Mr. H. A. Buckle's already famous 3½-in. gauge "Britannia"

left something to be desired; the lines could be finer and the main colour less blue and slightly darker. That the engine is a good worker, however, was clearly demonstrated at the Model Railway Exhibition last Easter. Mr. Blomquist's score was 345, which gained him a Bronze Model.

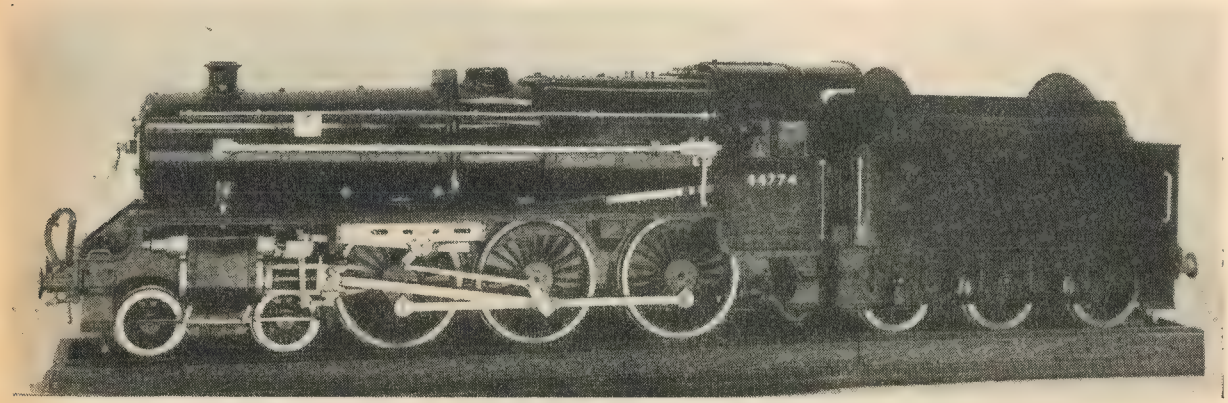
No. 4 was a ¾-in. scale S.R. *Lord Nelson* by Mr. T. Bridgett of Stoke-on-Trent. In view of the fact that he had never seen one of the full-size engines, he had made a very good job of it. But the tender is not large enough, and I think that the manifold fitting on top of the firebox could have been made to work instead of being a poor imitation of the real thing. The engine seems to be much too high, and should be a 4-cylinder job, but I have no doubt that it can give a good account of itself when in steam. With a score of 310, it won a Diploma.

No. 5 was the *Britannia* by Mr. H. A. F. Buckle of Ilford, which has already won some fame as being the one used by Mr. R. A. Riddles, designer of the prototype, when he inaugurated the Romford Model Engineering Society's track a few months ago. Mr. Buckle's work is neat and precise, and the engine has already run many miles. She scored 325 and won a "V.H.C."

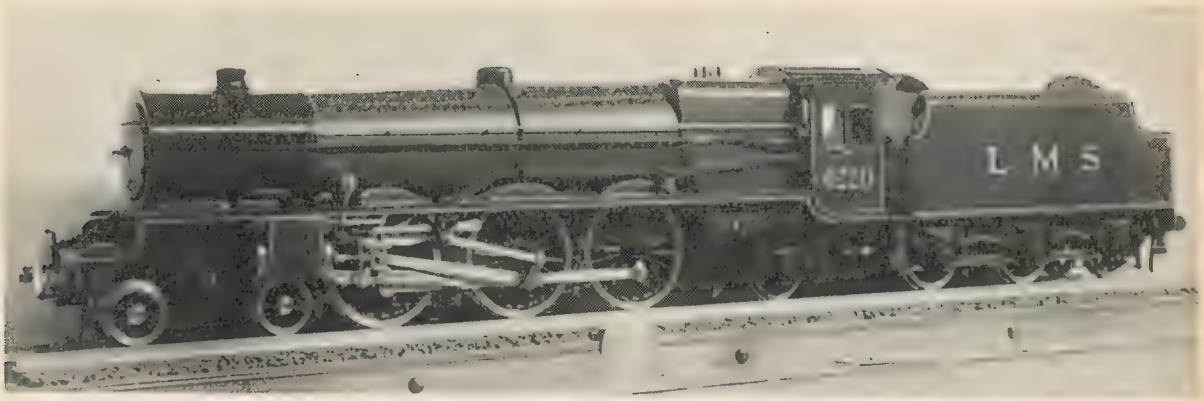
No. 6 was an interesting piece of work, another L.M.S. "Class 5" 4-6-0 built to ¾-in. scale; it is the work of Mr. A. H. Parrott of Normanton, who is an engineman on the L.M.R. and often drives one of the prototypes. It would appear to have got a little mixed between Classes 5MT and 5XP; a chimney of larger diameter would greatly improve its appearance and, possibly, its performance. Also, so many chromium-plated fittings seem to be out of place on a locomotive. Nevertheless, Mr. Parrott has made a good, substantial, working job of his engine for which he was awarded a V.H.C. Diploma and the A. J. Reeves prize.

No. 7 was an engine which tickled my fancy a lot! It was a 2½-in. scale, narrow-gauge saddle-tank engine based on one of the Peckett designs and made by Mr. S. J. Applewhite of Burton-on-Trent. The prototype is, or was, a purely industrial engine, but Mr. Applewhite uses his for heavy passenger duty for which I should imagine it to be almost ideal. The workmanship throughout is excellent; moreover, Mr. Applewhite obtained, first, the maker's drawings and then made a complete set of his own, working out the design to suit his own ideas while adhering strictly to the outline of the prototype. The use of solid rectangular brasses in the big-ends and the coupling-rods, without any means of adjustment for wear, is puzzling in an engine of this size; and they cannot be so easy to dismantle, when necessary, as the more usual split brasses with gibs and cotters would be. But there has been no skimping of the work in any part of the engine, every detail having been made with quite exemplary care and nicely, but not too "poshly," finished; the fitting, too, is of high quality. The score was 340 marks, gaining a Bronze Medal.

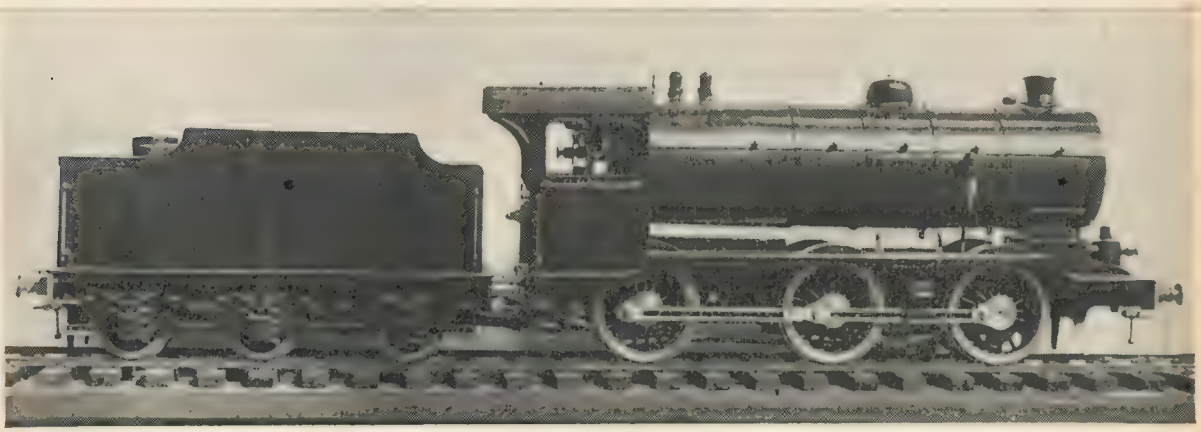
No. 8 was another oldtimer, this time a L.N.W.R. 2-2-2-0, 3-cylinder compound locomotive, *Jeanie Deans*, for 3½-in. gauge and made by Mr. E. E. Hobson of Chester. Obviously built to the published drawings for this model, it showed good work throughout and bore plenty of evidence that it had done much running on the track. Although, in workmanship and accuracy, it could not compare with some of its fellow-



An engineman's excellent effort. The 3½-in. gauge 4-6-0 engine by Mr. A. H. Parrott, an L.M.R. driver

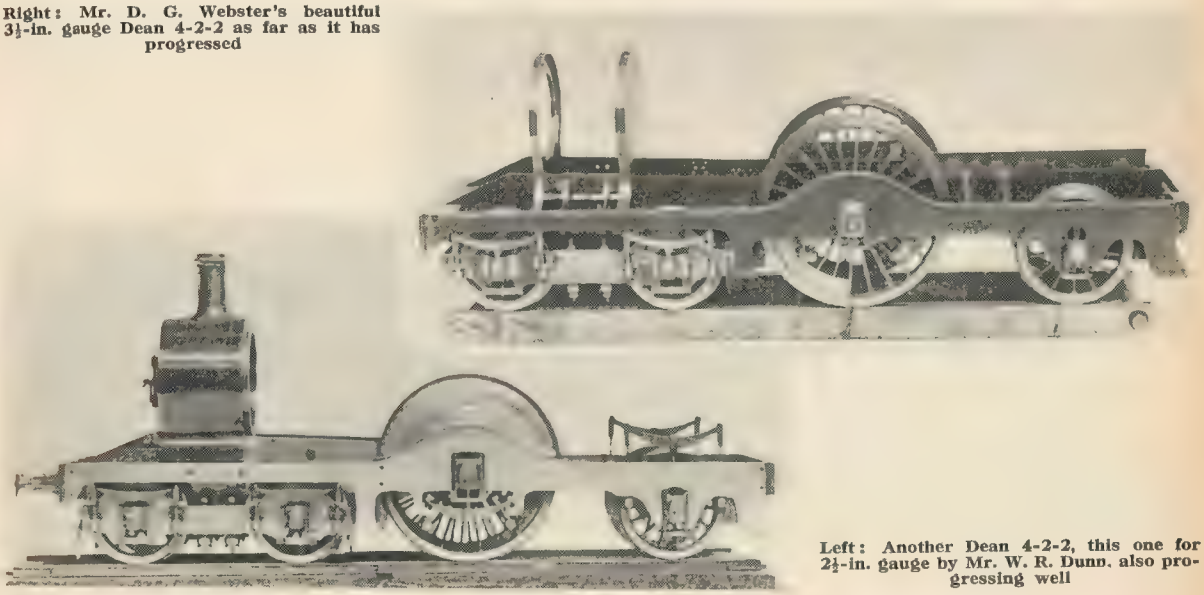


Superb workmanship throughout was the distinguishing feature of this 3½-in. gauge "Princess Royal" by Mr. A. L. Hutton



A very nice example of the 2½-in. gauge "Mary Ann" by Mr. C. R. Viewing

Right: Mr. D. G. Webster's beautiful 3½-in. gauge Dean 4-2-2 as far as it has progressed



Left: Another Dean 4-2-2, this one for 2½-in. gauge by Mr. W. R. Dunn, also progressing well

competitors, it succeeded in scoring 315 marks and winning a Diploma.

No. 9 was a very fine example of the L.M.S.R. 4-6-2 express engine, *Princess Royal*, in 3½-in. gauge by Mr. A. L. Hutton of London, S.E.9. *The* features of this job are the very fine workmanship in every detail, the neat, clean lines of all the platework, and that very intriguing 12-way mechanical lubricator which seemed to fascinate everybody who saw it. This engine is ¾-in. scale, is a 4-cylinder job, and nothing is offensively out of proportion. The cab fittings are neat, but robust and remarkably accurate; and I am sure that, if this engine and tender had been entirely finished, it would have won the Championship Cup. Some details, including another 12-way mechanical lubricator, have yet to be fitted to it; but, even so, it won a Silver Medal and the Bradbury Winter Cup, which it most thoroughly deserved. Perhaps, the rather hideous purple-brown colour it is painted will be altered later on.

No. 10 appealed strongly to me; for I have always loved *Mary Ann*, the 2½-in. gauge L.N.E.R. "J39" 0-6-0 "maid-of-all-work," by "L.B.S.C." Here was a very nice example made by Mr. C. R. Viewing, a Suffolk reader of THE MODEL ENGINEER; neat, clean, tidy and straightforward throughout, she was one of the best I have seen, and I doubt if her capabilities suffer in any way for this. Her score was 330 marks, and the award a V.H.C. Diploma.

No. 11 was another good example of one of "L.B.S.C.'s" outstanding successes, a *Hielan' Lassie*, by Mr. A. H. J. Whymark of Dovercourt, who very nearly tied with Mr. Viewing. The workmanship was good, and the engine had been carefully built to the published instructions; but a little more care in the general finish would have improved it. Another V.H.C. Diploma was the award, with the W. H. Waugh prize in addition; so I am looking forward to seeing Mr. Whymark's next job.

I can only add that I enjoyed the locomotive exhibits this year, at least as much as ever before; and I think my two colleagues, C. M. Keiller and C. R. H. Simpson, would say the same. We noted a commendable scarcity of slot-headed screws in the wrong places, but we take rather a dim view of the increasing tendency to use Allen screws on locomotives !

Before I close, I must mention a few locomotives which were in the Loan section. Two of these were especially interesting in being, respectively, 2½-in. gauge and 3½-in. gauge versions of the same type of engine, the G.W.R. Dean 4-2-2 express passenger engine of the 1890's. The smaller one is being built by our old friend, Mr. W. R. Dunn of Plymouth, to drawings and castings supplied by H. P. Jackson of Haxby. It has reached the stage where the frames, wheels, cylinders, valve-gear and bogie are finished, and the smokebox is in position. Of course, it shows some excellent workmanship, and it will be a lovely little job when it is finally completed.

The larger engine is the one being built by Mr. D. G. Webster of Maidenhead, and has been mentioned in THE MODEL ENGINEER more than once, during the past twelve months or so. Progress, of necessity, is slow; but the bogie is finished, the main frames are assembled, and the crank-axle is complete with the driving-wheels on it. The detail work on this engine, as far as it has gone, is beyond praise, and is an object-lesson in what can be achieved by fabrication instead of castings. Such details as outside and inside axleboxes, laminated springs and their hangers, all made to work and look exactly as their prototypes, are a joy to see. Will they stand up to hard work ? Of course they will, because they are being made for that purpose; but they will not stand much *rough usage*, which is quite another matter !

Another interesting exhibit was the 5-in. gauge Liverpool and Manchester Railway 0-4-2 engine, *Lion*, by Mr. L. B. Parkin of West Drayton. This engine, which needs a tender to finish it off, has been built chiefly from "L.B.S.C.'s" *Titfield Thunderbolt* particulars; but it includes a few differences, due to the fact that it has been completed before the finish of "L.B.S.C.'s" serial. Mr. Parkin has made a very good job of it, and it ought to cause much amusement when it is steamed on a track.

MODEL POWER BOAT NEWS

(*Continued from page* 387)

around 60 m.p.h. before performing a spectacular flip. J. Bamford's *Hero* also did some laps at high speed, throwing water some 10 ft. into the air from the large propeller. Unfortunately, neither of these boats could finish the course on either attempt, but another flash steamer, *Ifit* 9, made a good run in the Class "B" race, to qualify, for the Crebbin Trophy. The speed was 44.87 m.p.h., and it almost gained third place in the race as well, but the speed was just exceeded by G. Line's entry *Genevieve*.

G. Lines was also successful in the Class "A" race for the Speed Championship, and won with *Big Sparky* at a speed of 56.8 m.p.h. This was also the best speed of the day. This boat has been off form in recent regattas, and it is good to see it performing so well.

In the "C" Restricted Race, W. Everitt was unlucky when *Nah* capsized on both attempts, but K. Hyder (St. Albans) completed one run at 51.3 m.p.h., which was enough to win. Class "C" was again won by the holder R. Phillips with *Foz* 2, at a speed of 52.2 m.p.h., with B. Miles second at a slightly lower speed.

It should be mentioned that the 10 c.c. boats were handicapped to a greater extent by the bumpy water, than the larger boats, so these results are very worthy ones.

Full Results

80 *yd. Nomination Race*

(1) A. Rayman (Blackheath), *Yvette*: error nil.
(2) W. Hayward (Southend): error 0.2 sec.
(3) E. Vanner (Victoria), *Leda* 3: error 0.2 sec.
(4) P. Lambert (St. Albans): error 0.5 sec.

500 *yd. Race for E.D. Trophy. "C" Restricted*

(1) K. Hyder (St. Albans), *Slipper* 4: 51.3 m.p.h.
(2) C. Hancox (S. London), *Lady Joan*: 47.8 m.p.h.
(3) H. Poyser (Victoria), *Rumpus* 6: 44.2 m.p.h.

500 *yd. Race for the Victory Cup. Class "C"*

(1) R. Phillips (S. London), *Foz* 2: 52.2 m.p.h.
(2) B. Miles (S. London): 51.1 m.p.h.
(3) R. Mitchell (Runcorn), *Gamma* 3: 45.2 m.p.h.

Steering Competition for M.P.B.A. Trophy

(1) A. Squire (Kingsmere), *Comet III*: 13 points.
(2) F. Holme (Blackheath), *Doris*: 10 points.
(3) A. Loe (St. Albans), *Queen Mary*: 9 points.
(4) R. Curtis (Victoria), *Mickey*: 9 points.

500 *yd. Race for Mears Trophy. Class "B"*

(1) M. de B. Daly (Blackheath), *Nipper* 2: 54.1 m.p.h.
(2) R. Mitchell (Runcorn), *Beta* 4: 47.8 m.p.h.
(3) G. Lines (Orpington), *Genevieve*: 44.9 m.p.h.

500 *yd. Race for Speed Championship. Class "A"*

(1) G. Lines (Orpington), *Big Sparky*: 56.8 m.p.h.
(2) J. Benson (Blackheath), *Orthon*: 53.5 m.p.h.
(3) J. Innocent (Victoria), *Betty*: 48.7 m.p.h.

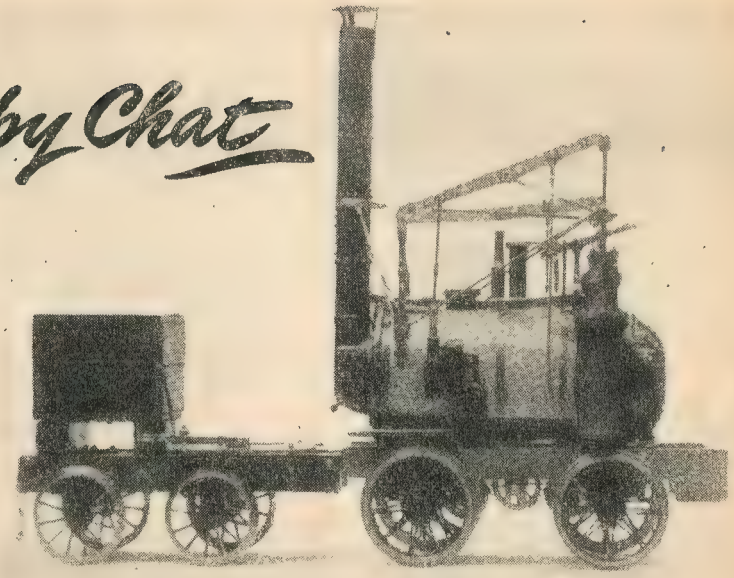
"M.E." Prototype Cup

P. Petch (Bromley), *Sir Robert Peel.*

Crebbin Trophy

A. Cockman (Victoria), *Ifit* 9: 44.87 m.p.h.

L.B.S.C.'s Lobby Chat



HOW TIME FLIES !

THESE notes are written several weeks before publication; and when looking up the date on which this instalment will appear, I find that it will be the issue for September 30th, and realise, with a sigh, that it marks the end of the thirtieth year of their non-stop run. It seems but a few months ago that I received an invitation from the late Mr. Percival Marshall to call at the office at Farringdon Street. It was a friendly, or rather cordial letter, in which he said that as I had proved all my contentions on the track, and that little coal-fired locomotives capable of hauling living loads were an accomplished fact, would I consider writing a weekly series, telling the readers how they could go and do likewise. The invitation was accepted, and I was received by Mr. Marshall himself, and the late Mr. Walter Runciman, who was then " first lieutenant," as our nautical friends would say. We went into details; I agreed to do the series, and the matter was settled with a friendly handshake. The first regular article appeared at the end of September, 1924; and despite opposition from the " old diehards " such as the Antediluvian Order of No Leaders and Small Porters, Messrs. Theory, Orthodox & Co. Unltd. and other similar organisations, trade firms who marketed boiler fittings, etc., of the type which Noah is reputed to have used on the bilge-pump boiler in the Ark, excursions and alarms by Jerry, and various other diversions—we're still here !

I find it difficult to realise that readers who are under thirty years of age, had not made an entry into this benighted world when my introductory article appeared; and that those between thirty-five and forty-four were just school-children. Maybe they are now in some cases grandparents ! I remember that first kick-off, complete with a small picture of my one and only niece, in a boy's sailor blouse and knickers, sitting behind old *Ayesha* on the track at my old home at Norbury. She is now nearing middle age, and has brought up a family in Northern Ireland. The old engine is still going strong; she has outlived the designer who prophesied that she would fall to pieces in a week, and looks like going on as long as her namesake. Only the other evening, she was hauling a three-passenger load, without trouble; and mention of Ireland reminds me that if any Eireann locomotive-builder doubts her ability to do the job, Mr. E. A. Tramp of the Dublin S.M.E. can soon put him wise, as he was here recently, and drove her himself.

Rough Going !

Judging from correspondence, and a few personal contacts that I made in the earlier days of these notes, some folk seem to be under the impression that it is as easy a job to write as it is for them to read; well, that's all they know ! The going has been pretty hard at times; but, looking back, I can honestly say, without wishing to make any idle boast, that I've done my best for both Editorial Dept. and readers, and never been late in delivering my copy and drawings. I started with two serious handicaps, as my only "literary" experience had been ordinary correspondence; and I have never had a lesson in mechanical draughtsmanship in my life. However, the letters that I wrote during the " Battle of the Boilers " in this journal, laid the foundation, in a manner of speaking, for the articles which eventually followed. You'll probably smile when I tell you that my own pet style of drawing was conceived by studying the methods of other contributors, and *not* adopting them ! Many of the drawings were too complicated, others difficult to follow because the presentation was not clear; and others still left too much to the imagination. Anyway, I figured that if I could understand the drawings myself, then anybody else could; so I went ahead in my own way, describing and illustrating every part of a locomotive in detail. My earlier efforts were a very long way behind Swindon and Crewe, but at least they were easy to understand; and I very deeply appreciate the many kind things that readers have said about my efforts with the working tools of a draughtsman, during the past decade.

My drawing has, at times, been done under great difficulty. I think the worst experience that I ever had, was when I was drawing out the valve gear for *Petrolea*. This was a Stephenson link motion for a pair of inside cylinders with valves and port faces inclined at a different angle to the cylinder bores. Outside my workshop door is a small flight of concrete steps leading up to the garden, and flanked by a low brick wall on the garden side. At the time, the " doodlebug " antic was in full blast—literally !—so I spread my drawing paper on a small blackboard, using it as a temporary drawing-board, and placed it on top of the wall; got my pencil, rubber, and drawing gadgets, and set to work, standing on the steps. At one stage of the proceedings, *seven doodlebugs (flying bombs, if any definition is needed) fell and exploded within half-a-mile radius, in five minutes.* I often wonder, even now, how the good folk who can't set out a link motion without sundry calculations, " rolypoly " diagrams, and all the rest of the rigmarole, would have managed under such conditions; but I finished my drawing, wrote the instructions with a fountain pen, resting my writing-pad on the wall, and sitting on the top step in daylight, and going down into the shelter when it was too dark to see the writing. The copy was delivered to our offices on time; and I have yet to hear of a *Petrolea* builder having any trouble in making and erecting the valve-gear, nor of any locomotive to which the gear was fitted failing to perform according to " guarantee."

Correspondence—and Correspondents

Soon after the articles started, letters began to arrive on all sorts of subjects relating to locomotive construction, and a good many that didn't. Now there is one thing that correspondents seem to forget entirely; and that is, that questions about things like boiler dimensions, valve-gear layouts, setting up and machining various castings and parts, and what-have-you, can seldom be answered off-hand, in the manner of a kiddy saying its "twice-one-are-two." Guaranteed information needs a little thought; and although I have the precious gift of visualising a finished locomotive, and can build one myself without any drawings, I don't possess telescopic eyes. This is one reason why I have told many people that I cannot give information by telephone. When writing my description of locomotive parts, how to machine them, and how to erect them, I have to think carefully before setting it down in black-and-white; yet I have actually received a trunk telephone call from a distance of 200 miles, the caller saying "I've built so-and-so engine from your description in THE MODEL ENGINEER, but it won't go, and can you tell me what is the matter with it?" This is no joke; I'm perfectly serious! I have received letters to the same effect; not the slightest word, nor explanation, about the "symptoms." Now these merchants are always insistently positive that the notes have been implicitly followed, and the fault is mine; invariably, the shoe is on the other foot. Either they have altered something to suit their own ideas, or those of Mr. I. Knowitall, or else their workmanship is defective. I'll give them their due—in most cases a simple checkover, acting on hints I have given, has revealed some simple defect that has easily been remedied, and everything in the garden has been lovely. The sequel has been apologies and thanks.

Per contra, many raw beginners have built an engine from the notes, and have had the surprise of their life when it not only "went," but did far more than I ever claimed. I received a letter from somebody to whom I had given a little information as to how he could make good a minor error in machining the cylinders of a *Juliet*. He said: "I have just put the bits together, and the blessed thing GOES—and *how* she goes!! A friend says she ought to be called *Goliath* instead of *Juliet*." That is as it should be; but the reason is that being an enthusiastic locomotive-builder (no hot air intended) who has "been through the mill" myself, the instructions are based on personal experience, and I'd just hate to "lead anybody up the garden path."

Bags of 'em!

Now I hope that readers will excuse a little plain speaking: during the thirty years that I have been on the job, I have encountered many correspondents who seem to be under the impression that they are the only "pebble on the beach," and that their queries should take first priority. There are two things that they don't realise: firstly, that, at times, my correspondence has reached over eighty letters per week (one week just after the war, I received over 100), and, secondly, that it takes just as long to get out information for one individual reader as it does to get it out for these notes. Obviously, it is a physical impossibility to give fully detailed information direct by post; yet it is, in many cases, expected.

I think that the most blatant case deserves to be put on record. An army sergeant wrote, from a certain depot, that he was going to build a 5-in. gauge tank engine to his own ideas, but there were some points he was not quite clear about. He enclosed a double sheet of foolscap containing no less than sixty-eight questions; no return ticket; and would I please reply by return, as he was waiting to get on with the job. As far as I know, he is still waiting!!

Despite the fact that I have begged of correspondents to confine any queries to locomotive matters, as I don't reckon to poach on other folk's preserves, in a manner of speaking, many regard me as a sort of general information bureau. For example, a Scottish correspondent wanted full details explaining how he could convert a domestic heating boiler to oil firing. He did enclose the return fare, so I gave him the names of two or three firms who specialise in oil-fired domestic boilers, and advised him to write them on the subject. I never heard how he got on! Queries by the score have come in about stationary engines and boilers, traction engines, steam rollers, electric and diesel locomotives—in fact the only things missing are jet planes and atom bombs; but I believe that cobblers should stick to their own lasts, unless circumstances are exceptional, so I turn them down. More than one marine-minded reader has insidiously suggested that as Billy Stroudley did a bit for the Newhaven-Dieppe steamers, I ought to do a little to help the paddle-and-screw merchants; not today, thank you!

In Lighter Vein

One thing that I have appreciated, and it is nothing to do with locomotive-building at that, is that many correspondents have treated me as an unseen personal friend in whom they could confide, saying that they could read between the lines of my notes. The reason for that, you'll all know in due course; for the present, nuff sed. Turning to the amusing side of thirty years' letters, I find that the writers are apparently not human beings, but colours, animals, trades, places, and goodness-only-knows what else! Letters have come from Messrs. Black, White, Grey, Green, Brown, Pink, Reddish, Puce; Lyon, Catte, Cowe, Bull, Calf, Horsey, Colt, Steer, Lamb, Panther, Leppard, Stag, Wallaby; Salmon, Fish, Bream, Herring, Whale, Hake, Brisling, Crabbe, Winkel, Whiting; Cakebread, Pye; Butcher, Baker, Miller, Farmer, Smith (bags of 'em!), Taylor (ditto), Turner, Carpenter, Joiner, Carver, Painter, Wheeler, Carter, Naylor, Wright, Spinner, Cook; Church, Chappell, Pope, Bishop, Deacon, Warden, Vicarage, Parsons; Pound, Sterling, Golding, Silverman, Tanner, Penny, Farthing; Leader, Driver, Middleton, Traylor; Beere, Hale, Maltby, Hopkins, Brewer, Barton; Bird, Starling, Larkin, Sparrow, Nightingale, Hawke, Falcon, Crane, Heron, Warbler; Hunter, Fisher, Player; Betson, Gamble; Long, Short, Little; Lane, Street, Rhodes, Field, Meadows, Brook, Rivers, Lake, Hill, Pond, Waters, Glenn, Glade; Airey, Gale, Sleet, Rayne, Snow; Wood, Tree, Fell; Venus, Moon; and a Dickens (Shakespeare, Thackeray, Longfellow, Burns) of a Lott Moore that I can't recollect just at the minute. However, I *did* get letters from human beings; Mann, Child, Girling, Boyson, Kidd. If I'd have kept a full list of all the names and addresses, it would have made a companion volume to the telephone directory!

Ah well—such is life. If my humble efforts have made locomotive-building an easy and pleasurable job, then they haven't been in vain; and I don't regret the hours and hours spent on scheming and experimenting, so that the followers of these notes could have really "guaranteed" instructions. It is *results* that count!

A Real Old-timer

Many moons ago, a reader interested in old-timers, Mr. Eric J. Szlumper, wrote that he was contemplating the building of a *Puffing Billy* in 3½-in. gauge, and asked if it could be made a reasonably correct copy of the old girl now in the South Kensington Museum, yet able to run under its own steam. I told him that it could, and we had some correspondence over various details, especially the boiler. This is of the return-flue type, fired at the chimney end, and I schemed out a boiler which was externally like the original, but had a firebox and tubes entirely within the barrel. If all goes well, and our worthy friend with the blue pencil raises no objection, I will give a sectional drawing of it later on, as it should be of some value to others interested in these old locomotives, if they thought of building one. The principle is adaptable to any of the old return-flue boilers.

Well, our friend got busy; and despite the upheaval of two removals, from Bucks to Northants, then on to Leicester, he has nearly completed the job, as the heading photograph will show. The externals and the working parts are faithfully reproduced in the little engine; note the wheels, cylinders, feed pump, domed end of the boiler, the

(*Continued on page* 396)

Traction-engines at the "M.E." Exhibition

By W. J. Hughes

One of the pair of inch-scale Fowler ploughing-engines built by R. W. Palmer of Southampton

AMONG the traction-engines at this year's Exhibition the most outstanding were undoubtedly the pair of Fowler ploughing-engines built by R. W. Palmer, of Southampton. In fact, the judges considered this exhibit worthy of the award of a Bronze Medal.

Building a *pair* of engines naturally involves a great deal of repetition work, especially when much detail has to be incorporated, but in the main Mr. Palmer's work bore no signs of patience being lost. Exceptions to this were odd file-marks here and there, and a failure to "marry-up" correctly the halves of the eccentric straps where they met.

It was rather a disappointment that the engines were non-working in the sense that the boilers were dummy. This may well be because the builder has not the necessary equipment—I have no information on this—but Mr. Palmer had been to a great deal of trouble to get in as much detail as possible. This included all steam-pipes and cocks, injectors, lubricators, whistles and spuds.

The change-speed mechanism and other gearing were well modelled, and so were the winding-drums with their coiling-gear. At the same time the brass used for these would have looked better "disguised" by matt plating, or even tinning, to represent steel or iron.

In the group, Mr. Palmer had included the mole-drainer previously exhibited, but I wish he had sent also his balance-plough. I think this would have conveyed a better idea to the general public of the functions of the machines, than did the mole-drainer. Many people did not understand this, but the balance-plough would have been almost self-explanatory.

A General-purpose Traction-engine

Near to the inch-scale ploughing-engines was a 1½-in. scale Burrell 7 n.h.p. traction-engine, built by the brothers H. R. and G. A. Plastow of Enfield. This engine was well finished in the mechanical sense, and the paint-work was smooth with neat lining.

On the whole the detail was quite good, too, but the *copper* rivets in the hind-wheel strakes were very obtrusive. Another very noticeable defect was that the webs of the crank-shaft were too square. In this particular prototype the shaft would be forged from round bar, and so the webs of the model should be round, or almost round, in section, of course. If the model crankshaft is cut from the solid, the rounding should be done by careful filing.

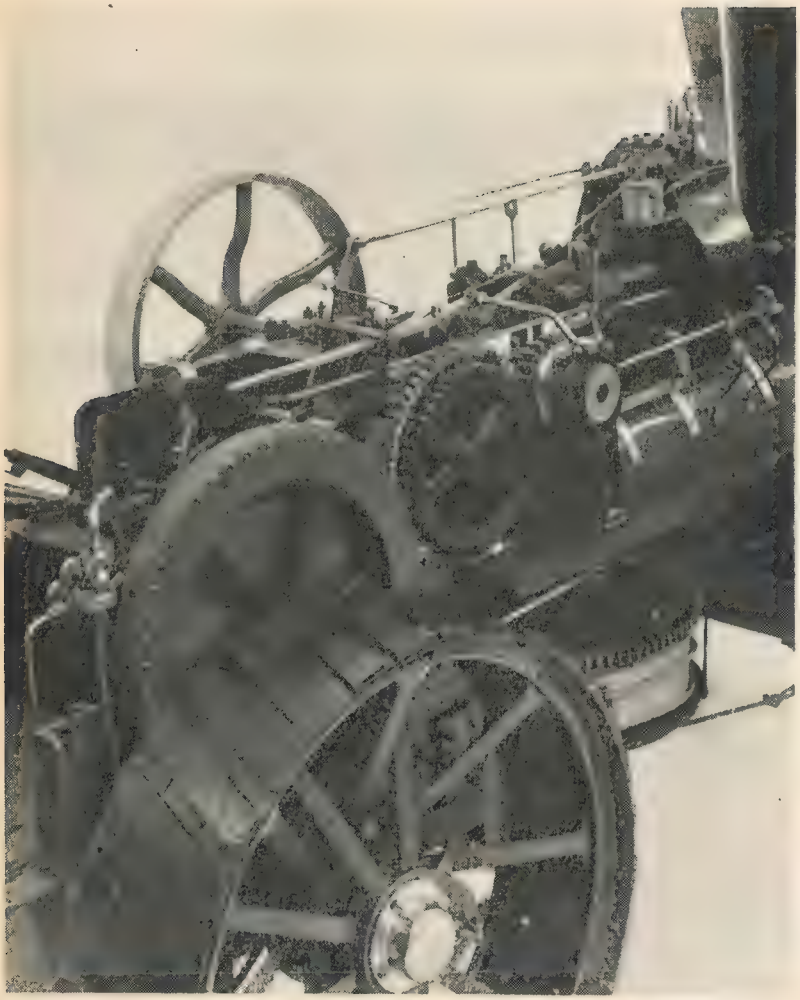
A. J. Ferris, of Acton, had sent along a small traction-engine of the type which one often sees at Exhibitions. It is frequently described as a "¾-in. scale Burrell," but this is entirely wrong, because the proportions are hopelessly out-of-scale, and it does not resemble a Burrell (or any make) at all.

Mr. Ferris had made a good job of the engine, and it was disappointing to think that he, like many others, had spent a great deal of time in producing a machine which is so incorrect in so many ways: cylinder, gearing, wheels, and chimney, among others.

A Free-lance Steam-roller

Another nicely-built and finished model was the free-lance inch-scale steam-roller built by H. Grayson, of Kent. The proportions were good, except perhaps that the cylinder block was rather large in appearance.

This engine had two simple cylinders, with piston-valves above. The latter were driven through rockers, the rocker-lever being carried in bearings on the



Close-up to show some of the realistic detail work of the ploughing-engines

Right: Built by H. R. and G. R. Plastow of Enfield, this Burrell general-purpose engine was well-finished

tops of the trunk-guides. A separate saddle was fitted to the boiler for mounting the cylinder-block.

An unusual feature was that the crankshaft was carried in three bearings, the central one being mounted on the firebox top. The engine was spirit-fired, presumably with a Smithies type boiler in the dummy outer casing.

Passenger-hauling

Listeners to the broadcast from the Exhibition would hear the 2-in. scale traction-engine built by E. J. Baughen, of Wimbledon, as she did a spot of passenger-hauling. She was only engaged on this duty intermittently, but performed it with gusto, and must have given many hundreds of children pleasure in this way.

As mentioned in THE MODEL ENGINEER of August 19th, she was built especially for hard work—"duty-not-beauty"—but for all that the general proportions were good. Thanks to the large scale, the engine was easy to keep in steam; with a boiler of this size the fire needs but infrequent attention, and it provided ample steam for the two high-pressure cylinders.

I had the pleasure of driving the engine for two fairly long periods, and can vouch for the fact that she is powerful and easy to handle. As an extra safety-precaution for the Exhibition, Mr. Baughen had cut the working-pressure to 60 p.s.i., but even at this, and with a high-gear ratio of 5 to 1, she made easy work of towing a dozen youngsters.

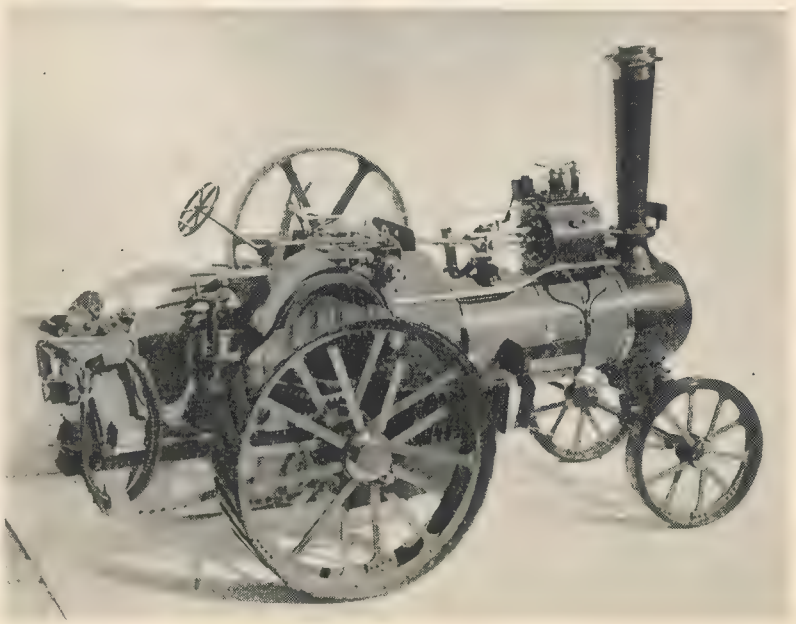
At other times, the engine was to be seen generating, lighting a number of bulbs under a canopy which had been hastily built to allow this.

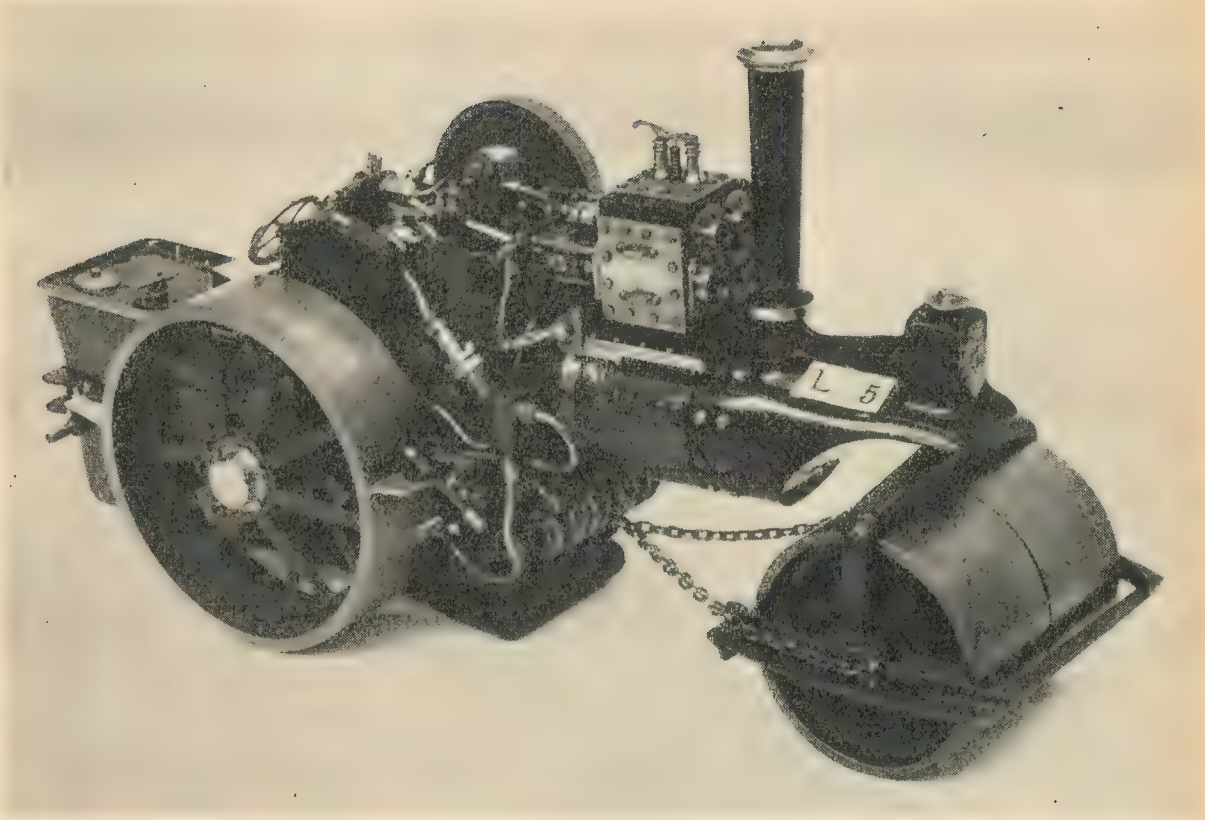
"Tin-can" Engines

On the stand of the Drydex and Exide concern were three "toy" traction-engines made from tin-cans of various kinds, after the style of the toy steam-roller which I described in THE MODEL ENGINEER a few years ago, as many readers will remember.

However, the "Drydex" engines were driven by electric motor, and were fitted with dummy motion-work, which was quite an improvement. The small motor was mounted low down in the tender, and the operating battery in the "boiler."

These engines created considerable interest as they circled round continuously, and probably many fathers who saw them ear-marked the idea with a view to the problem of the Christmas stocking. If so, some of them may be interested to know that I developed a spirit-fired *steam*-driven version of





A well-proportioned free-lance model was this inch-scale steam-roller by H. Grayson of Kent

my roller, which is described in Ward, Lock's book *Model-making for Boys*.

Lastly, there was another model of a steam-driven road-vehicle in the Exhibition; it was a 4 mm. scale model of a Thornycroft steam omnibus on the stand of the Ilford and West Essex M.R.C.

Unfortunately, I cannot give the maker's name—when I enquired the attendant could not tell me—but whoever it was I congratulate him on a very nice little model which will add realism to a " period " railway, which I presume his is.

L.B.S.C.'s LOBBY CHAT

(*Continued from page* 393)

array of pimples, and other details all-present-and-correct-sergeant. Bro. Eric says it was a dickens of a battle between Inspector Meticulous and common sense, but honours are easy, both being well satisfied. As the tappet valve-gear doesn't work from eccentrics, and is independent of the axles, it was possible to test the " works " under air pressure without any connecting-rods; and when connected to a compressor, and with nothing to act as flywheels to steady her, she went off like a road drill " gone barmy " as the kiddies would say, the beams disappearing in a blur. There will be no fear of her not doing the job when finished, and our friend certainly deserves a meed of praise for the patient workmanship he has put into the job. I'd love to see her on my own road along with Driver Syd Herbert's *Invicta*, the outside of which he has finished off in the same way as that of the old lady who still " stands in the Market Place." We should really feel that we were " back in the days " !

Just as Anticipated

Followers of these notes will recollect that I have often commented on the uselessness of so-called " scale " backhead fittings, which look lovely in a photograph, but no good for service. Several readers have forwarded me copies of a club journal, in which it is stated that the " scale " boiler fittings of a much-photographed tank engine, proved N.B.G. and have been replaced, in the words of the journal, " by others less glamorous, but more serviceable." The proof of the pudding is in the eating! Just recently I have furnished my 2-6-6-4 *Annabel* with a completely new set of boiler fittings, and replaced the original pipework with my " standard " layout. When the late " Bro. Wholesale " had the engine, he tried to make the footplate look like one of the pictures in the *Locomotive Cyclopedia*, with an imposing array of cocks, valves, wheels and handles, including a water column for the gauge glass. These were all right for a time, but latterly began to leak; and the last time that I tried to clean out the water column, the top broke off. I thereupon decided to scrap the lot, and replace them with my usual type. This has made a vast improvement, as I have altered the layout so as to make everything easily get-at-able over the long tender. Incidentally this locomotive has the little turbo-generator which was given to me by Bobby Thompson, of South Carolina, and it lights the headlight at night, using very little steam, the effect being exceedingly realistic; the beam lights up the track ahead, just like full-size. I've got used to judging the voltage by the pitch of the whining note given out by the generator when running, so the bulb doesn't get burnt out. As soon as I can get somebody to take shots of the mounted generator, and the footplate, I hope to include them in these notes.

Electric Furnace Construction

By E. Riley

SOME months ago, I made a small electric muffle along the lines of the one described by Mr. Avery in the December, 1952, issue of "Practical Mechanics." This was so successful that I immediately contemplated building a larger muffle with suitable equipment for temperature measurement.

About the same time, "Duplex" described one in THE MODEL ENGINEER, and the photographs show the larger muffle with the case made out of $\frac{5}{8}$ in. thick Sindanyo heat-resisting board. This material is highly satisfactory and is manufactured by Turner's Asbestos Cement Co. Ltd., Manchester. The Sindanyo case is held together by $\frac{3}{4}$ in. $\times \frac{3}{4}$ in. $\times \frac{1}{8}$ in. angle cleats which are tapped $\frac{3}{16}$ in. Whit.

Basically, there is little difference between the main design of my muffle and the "Duplex" product. However, I suggest that the Pyruma cement jacket is omitted and that the element-clamping device suggested by "Duplex" is definitely abandoned. A more convenient form of anchoring is to make a double twisted length of wire long enough for the lead and also for one wrap around the muffle. This can then be secured by twisting the ends together before winding the element. I also fitted a cast-iron door, which is neater and easier to make.

In the case of the small muffle, $\frac{5}{8}$ in. thick Sindanyo is used only for the end boards, and a 20-G sheet metal jacket is held in position with $\frac{1}{4}$ in. diameter stretcher rods.

In each case, I supported the front end of the muffle by recessing, to about $\frac{3}{16}$ in. deep, the inside face of the front board. The small muffle is unsupported at the rear, whilst the larger one is supported similarly to the "Duplex" design. It is essential, of course, that the muffle is not held rigidly by the strap, but is quite sloppy.

Anyone contemplating building the small muffle would do well to read the article already mentioned. The cost of the smaller muffle was approximately £1, and the larger one approximately £3 10s. The latter figure is, perhaps, much higher than would be the one described by "Duplex," but I think that the extra cost of purchasing the Sindanyo board would be well justified.

The energy regulator control can be obtained for £1 6s., and is manufactured by Sunvic Ltd. This is a better proposition for this purpose than the Simmerstat type control.

The thermocouple is exactly *a la Duplex*, except that I used a different gauge of wire, and the insulating sleeve up the tube is built up from the more easily obtained insulating bead. The pyrometer is mounted in an old switch casing, and before conversion was a 0-50 milliammeter. The instrument was calibrated against a standard thermocouple and pyrometer, but I have checked it again by the methods described in the "Duplex" article.

Since this short description may enthuse some of my readers, I give below a short list showing materials used and their source, which, I found was sometimes elusive. The design of the element can be found from the booklet issued by British Driver-Harris.

200 W. Muffle

Muffle—Core of bowl fire element, 1 in. diameter hole × 3 in. deep.

Element—32-G Nichrome V. British Driver Harris, Gaythorn, Manchester.

Element—C.60 Alumina Cement. Thermal Syndicate Ltd., Northumberland.

Casing—$\frac{5}{8}$ in. thick Sindanyo end boards, 20-G sheet metal jacket.

Lagging—Bestobell L.7 Superheat Bell's Asbestos & Engineering Ltd., Manchester.

800 W. Muffle

Muffle—Vitreosil, closed at one end 3 in. × $2\frac{1}{2}$ in. × $6\frac{1}{2}$ in. inside, type No. 69. Thermal Syndicate Ltd., Northumberland.

Element—24-G Nichrome V. British Driver Harris, Gaythorn, Manchester.

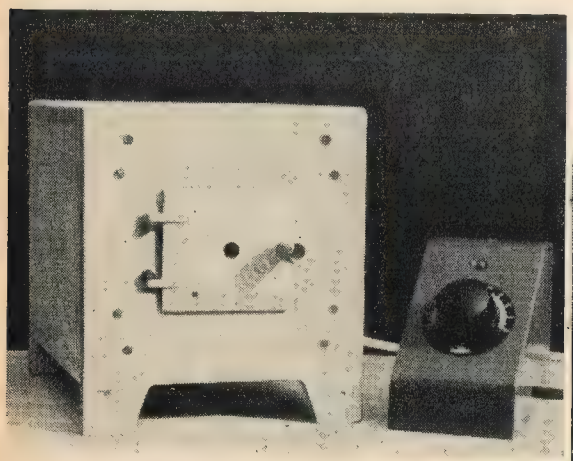
Element—C.60 Alumina Cement. Thermal Syndicate Ltd., Northumberland.

Casing—$\frac{5}{8}$ in. thick Sindanyo Board throughout.

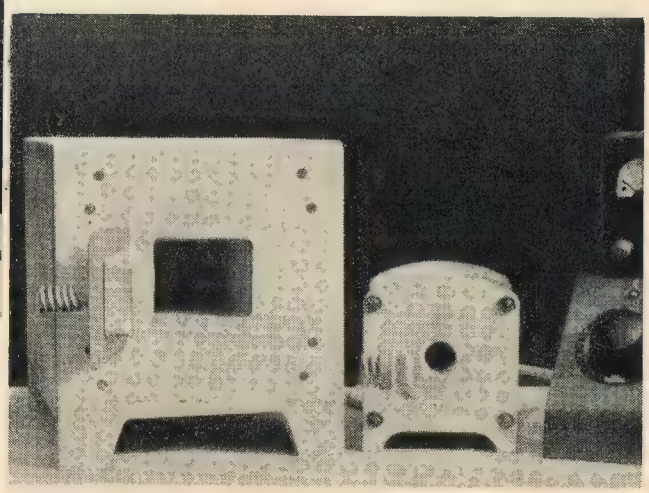
Lagging—Bestobell L.7 Superheat. Bell's Asbestos and Engineering Ltd., Manchester.

Since writing this article, I have found that, with frequent use, the thermocouple as described left a great deal to be desired and I have purchased a commercial one which is $\frac{3}{8}$ in. diameter and 6 in. long on the stem and is complete with leads. These can be obtained from most laboratory furnishers; mine was purchased from J. W. Towers, Widnes, and cost 33s. To anyone using this equipment regularly I would suggest this is essential.

Also, I would like to say that I would be prepared to show this equipment to any interested person by prior arrangement.



Above : The "Duplex" type muffle



Right : The same, together with the small "Avery" type muffle

By Edgar T. Westbury

A simple Geared Impulse Turbine

THE machining of the turbine rotor is by no means as formidable as might appear to some of the less experienced readers; it is certainly very much easier than making a de Laval type rotor from the solid, as some of our intrepid experimenters beforementioned have done. Simplicity, indeed, is its primary excuse for existence, though that does not imply that I admit it to be more than a makeshift substitute for the above type. The material used should be a good quality, but not too tough, grade of bronze; free machining is very desirable in order to facilitate milling and avoid blunting the cutter. As a substitute, it is possible to use brass, provided that it is not to be used with too highly superheated steam.

The blank may be machined all over before cutting the teeth or "blades," though in my own case I left the recessing of the sides until afterwards. A hub bush is fitted for the same reason as in the case of the gearwheel; a bore of not less than ¼ in. is desirable for rigid mounting on the milling arbor. I bored my experimental blanks ⅜ in. diameter and the hub bushes were secured with three 10 B.A. screws through the flange, but I have since concluded that neither of these measures is really necessary. The external dimension of 1.490 in. does not imply that fine limits are necessary; the essential thing is to ensure enough, but not too much, clearance in the casing, and I found that 5 thou. radial clearance appeared to be satisfactory.

Nearly all the factors in the cutting of the teeth have been varied in the course of experiments, and I am not prepared to say even now that the best possible results have been attained. I am, however, fairly well satisfied with those produced by the rotor shown in the detail drawings, which has 30 teeth approximately 5/64 in. or 0.080 in. deep, produced by a 60-degree "dovetail" end mill presented tangentially to the blank, as shown.

Concluded from page 340, September 16, 1954.

A Simple Milling Fixture

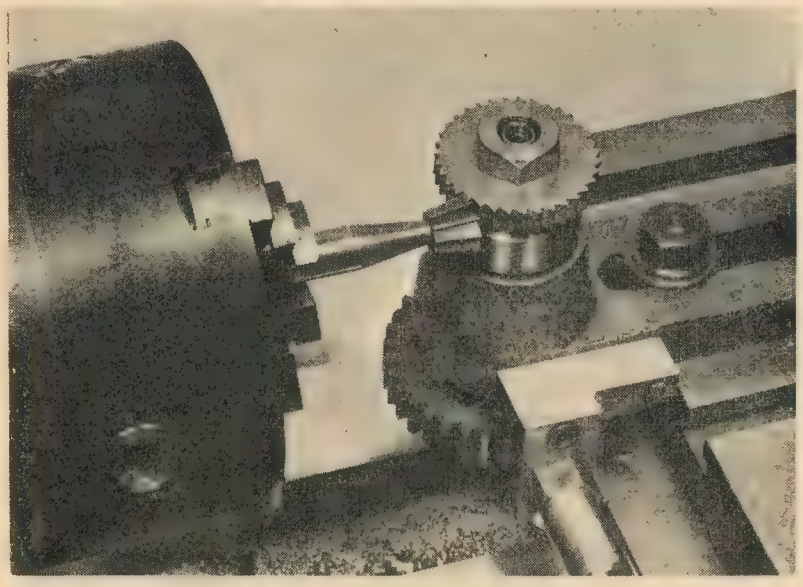
The milling operation may be carried out in various ways, including the use of a milling spindle on the vertical slide, in conjunction with indexing gear on the lathe mandrel. In my case, I realised that I might have to produce a number of different rotors before I obtained the desired results, and therefore it would be worth while to make a fixture for holding the blank, mounted on the cross slide, enabling the lathe mandrel to be used to drive the cutter. Whatever method is used, however, I consider that rigid mounting and accurate indexing are highly important, not so much for ensuring perfection of tooth form (which is largely arbitrary anyway) as to enable exactly the same amount of metal to be removed at each cut, and thus preserve balance, which is so important in any high-speed mechanism.

The fixture employed was improvised from an old tee-rest support, but could be made almost as easily by welding, brazing or otherwise securing a short bush to a flat bar or plate so that it could be mounted vertically on the cross slide, overhanging the left-hand side. This forms a bearing for a vertical mandrel to carry the blank at the top end, and a gear wheel, or other simple indexing device, at the bottom. The mandrel must be a good fit in its bearing, and have all end play taken out by means of an adjustable thrust collar; some means of locking it without imposing any torque stress or other deflecting force is also desirable, though I found it sufficient to use a pretty strong spring on the indexing plunger. This is of the orthodox type, made a close fit in the spring barrel and terminating in a properly shaped tooth to fit between the teeth of the gearwheel, without bottoming. It is not necessary to provide means of holding the plunger out of engagement with the gearwheel, as usually fitted to indexing appliances.

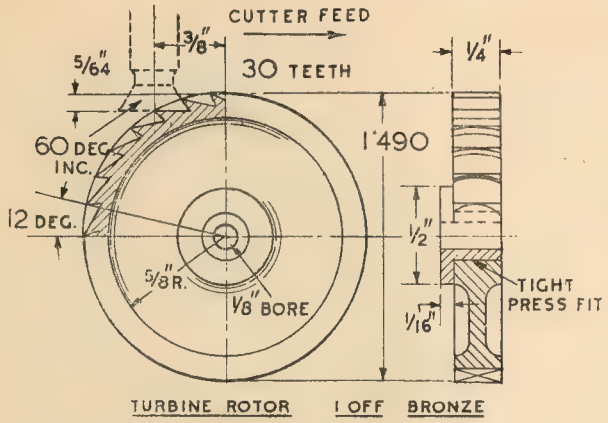
Some simple devices of this nature are fitted with screwed index plungers, which are easy to make, and will provide positive locking, but I do not favour these, as it is extremely difficult to ensure exact fit and truth of screwed parts, especially when wear of the threads has taken place, and I have found that errors of indexing are possible with them. Spring plunger or latch type detents are, in my opinion, much more satisfactory.

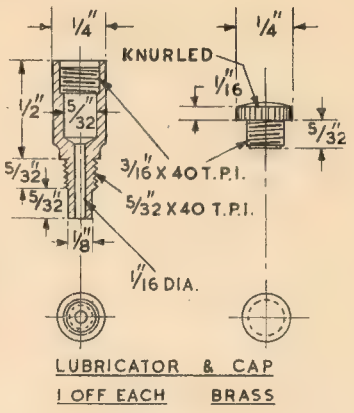
The blank is secured to an extension at the top of the mandrel, turned to fit the bore closely, and secured by a nut. Its level can be adjusted by shims and washers to the correct level relative to the lathe centres. In the example shown, the blank was not set exactly symmetrical to centre height, being a few thousandths of an inch high to produce a steeper angle of tooth on the entry side, but this detail may not be very important.

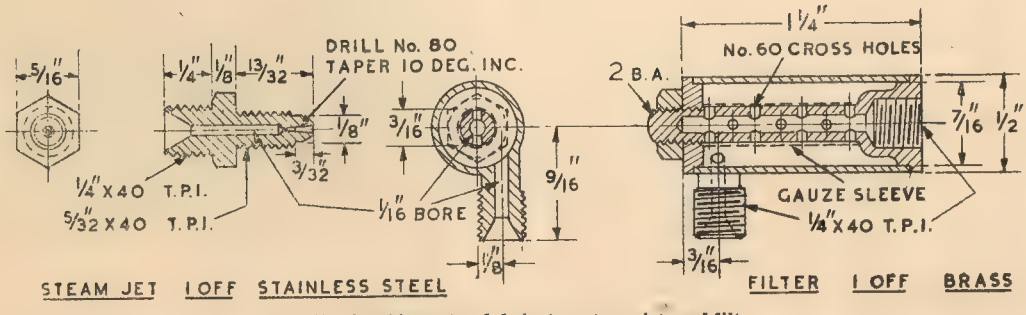
Several different cutters have been used, including both ready-made and home-made types, the latter being in no way inferior for this particular job, but if anything, rather better, as it is easier to ensure their keenness



Rotor set up on vertical indexing spindle for machining the teeth. (Note : this is not the rotor, or the type of cutter, finally used)







Details of turbine rotor, lubricator, steam jet, and filter

or renew the edge if it gets dull. The simple two-edged flat cutter which can be made in a few minutes from a piece of silver steel bar, is as satisfactory as one could possibly wish.

Having set the job up, the actual cutting operation is plain sailing. The lateral position of the fixture can be measured by first setting the cross-slide to centre the work arbor roughly, and running the saddle up until the edge of the blank just touches the cutter; the cross-slide is then backed out and the saddle advanced towards the cutter approximately 80 thou., as measured on the leadscrew index. The saddle is then locked, not simply by engaging the leadscrew, but by a positive clamping device, so as to ensure that it cannot move during the operation. If desired, however, the initial feed may be a few thou. less than final depth, to allow for a fine finishing cut on the second time round.

The traverse of the cutter should be limited to within $\frac{3}{8}$ in. of the central position, as shown, so as to just produce the maximum tooth depth. As this position is not easy to measure, it can be found by taking the first cut to something less than full traverse, then taking a second cut in far enough to meet the flat seating produced by the first cut. Allowance must, of course, be made if it is intended to use more than one cut in the depthing of the teeth. The limit position must be kept constant for each tooth, either by working carefully to the cross-slide index, or, much better, by improvising a definite limit stop on the slide.

The cut may be taken either from the front or the back, as found to be most convenient. With the blank forward of the lathe mandrel, and normal direction of rotation, the cutter thrust is downwards, which may seem best, but I have not found that it makes much difference which way one works, providing that all end play in the fixture is taken up. Don't forget, however, that it will affect the way the rotor must be mounted on its hub, to produce clockwise rotation, in conjunction with the position of the jet indicated on the drawings.

With the simple and rigid set-up shown, the machining of the rotor teeth is as easy as shelling peas, and the results sufficiently accurate to avoid the need of static balancing afterwards, which is a very delicate job to undertake on so small a rotor, and best avoided if possible. One point which may be worth mentioning, in case it should give rise to queries, is that the teeth, when machined, will not entirely cut away the turned edge of the rotor, but will leave triangular "lands" at the sides; these are the points of smallest clearance between rotor and casing, and should just give the required running clearance. They can be seen in the close-up photograph of the rotor, which, incidentally, looks rougher than it really is, due to the rather hard lighting, which has the effect of magnifying every scratch into a furrow.

Steam Jet

It is recommended that this should be made of stainless steel, as it is less likely to be eroded internally than non-ferrous metals, while being also immune from rust or chemical action. Those who have had experience with full-size turbines will need no reminding of how superheated steam will literally eat away solid metal, when moving at high velocity, as in a turbine jet. The free-cutting grade of stainless-steel, as sold by "M.E." advertisers, is quite suitable, and calls for no more than normal care in keeping tools keen and properly set; the high-tensile stainless steels, however, are a horse of a very

different colour, and one is liable to encounter difficulties, especially in fine drilling operations, when using them.

It is recommended that this component should first be machined from the inlet end, including drilling the parallel hole to a deph of $\frac{5}{8}$ in., the conical seating for the nipple of the union, and the external thread. A piece of metal should then be drilled and tapped truly while held in the chuck, and the component screwed into it for dealing with the other end. The external turning, including the screwing with the aid of a tailstock die, is simple enough, but the very small hole in the centre may present difficulty unless a high-speed drilling spindle is available. I have, however, dealt with this operation by fitting the drill in a pin chuck with a parallel shank, which is guided, *but not gripped*, in the jaws of the tailstock drill chuck, and the feed applied with the fingers. One can thus feel even the smallest drill cutting, and it can be backed out or released at the least sign that it is not cutting properly. A D-bit or broach with an included angle of 10 deg. is made for tapering the hole, and lastly a D-bit or old $\frac{1}{16}$-in. drill, ground to an included angle of not more than 60 deg., inserted from the other end to remove any "exit burrs" and fair the throat of the passage.

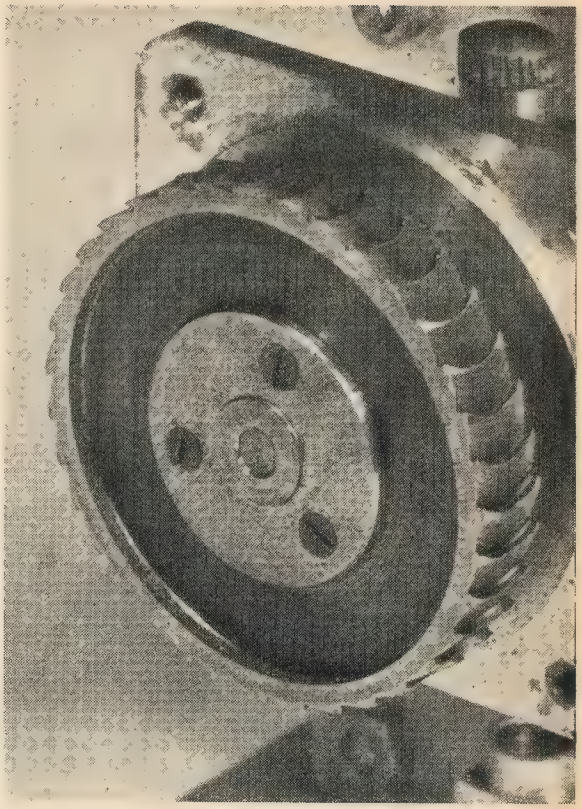
It is advisable to make two or three jets of different sizes for experimental purposes. Enlarging the jet will obviously increase the power of the turbine—within limits—but will also make greater demands on the boiler, and where this is limited in size, the jet must be kept small enough to enable the required steam pressure to be maintained. The tip of the jet should be as close as possible to the turbine rotor without actually touching it, and adjustment by means of shims or washers may be desirable to attain this end.

Both the side angle and laterial position of the jet are extremely important in obtaining the best efficiency from the turbine. In an experiment made some years ago, I made a ball socket mounting for the jet, to enable this to be adjusted, but this has not been considered necessary in the present case. Slight endwise adjustment of the rotor position, however, may be found desirable, and this can be carried out before finally locating the position of the oil hole in the rotor bush.

Lubricator

This is simply an oil cup with some form of a cap or closure to prevent the entry of foreign matter, and it is made of this particular shape for the sake of accessibility. A short cup of larger diameter is not so easy to manipulate in the space between the flanges, especially when the turbine is hot. One or two drops of *thin* oil, preferably graphited, are sufficient to keep the shaft lubricated for 15 minutes' running, and any lack of lubrication is soon shown by the slowing down of the turbine, long before any harm is likely to be done.

The gearing also calls for thin oil—and not too much of it, as experience has shown that oil drag is quite capable of slowing down the turbine as much as 50 per cent. That is why the oil overflow pipe is set so that the amount of oil in the casing, allowing for the unit to be tilted about 10 deg. to suit the angle of propeller shaft, is just enough to allow the teeth of the gearwheel to dip in it. (The overflow on the experimental turbine is definitely too high when the shaft is inclined to the above angle). Oil can be fed into the gearcase through the breather pipe at the top; the two gearshaft bushes are adequately lubricated by oil mist.



A close-up of the rotor as finally fitted to the experimental turbine

Coupling

Any form of shaft coupling may be used; the one specified is slotted to take the simple "ball and pin" joint, which has been found most satisfactory for small propeller shafts.

Oil Seal

A fibre disc is shown for closing the inner end of the gearshaft bearing; this, of course, is optional, but it has a reason for its existence, as it prevents oil leakage from this end of the bearing, but it is easily removed if it should be found desirable to extend this end of the shaft to drive a pump or other auxiliary plant.

Filter

This component is not shown on the general arrangement drawing, but has been found desirable on the experimental turbine, on account of trouble encountered with clogged jets. It consists of a small chamber fitted to the steam jet, with a tangential entry pipe and a central perforated tube surrounded by a loosely-fitted sleeve of fine gauze. The swirling effect of the incoming steam tends to throw any solid matter towards the sides, and only clean steam reaches the jet. It might be considered desirable to make this fitting a good deal larger, and fit it with a blowdown cock, but it serves its purpose fairly effectively, and is very easily taken to pieces for cleaning, by removing the top nut. This fitting can be seen in the photographs of the experimental turbine. Judging by the grit and scale which is collected in this filter, it would appear to be a very desirable fitting on steam engines of all types, apart from turbines.

In offering this design to readers, I sincerely hope that if it does nothing else, it will set them thinking, and that some of them will be persuaded to start experimenting where this particular design leaves off. No doubt the design will be severely criticised, if not absolutely "shot down in flames," by the experts, particularly those who have never built an engine in their lives. (I shall be very disappointed if it is not !). As with previous designs in this series, I can at least claim for this one that *it works*, and if readers concede that variety is the spice of life, this one will contribute just a little more seasoning to the model engineers' already well-flavoured diet.

As I like to give all my engine designs a title, if only to prevent confusion in dealing with queries, I am calling this one the "Spinette."

One of our good friends in the trade has offered to supply castings for its construction and these, I trust, will be available in the near future. And now I propose to close the present series of "Utility Steam Engine" articles—but I'll be back with new designs in due course.

READERS' LETTERS

Letters of general interest on all subjects relating to model engineering are welcomed. A nom-de-plume may be used, but the name and address of the sender must accompany the letter. The Managing Editor does not accept responsibility for the views expressed by correspondents.

THE LOCOMOTIVE OF THE FUTURE

DEAR SIR,—Your correspondents seem to have failed to allow for the fact that the "City of Truro" design was never intended to be a slavish copy of any existing machine. They appear to see this matter only from the information they have managed to cull from some existing design; any departure from this appears to be beyond their powers of comprehension and they therefore deem it as impossible.

In the article of June 17th, "L.B.S.C." gave the width over the outside cylinders as approximately 8 ft. 6 in. This is quite correct. The actual dimension over the camshaft rocking levers is 8 ft. 8¾ in. The illustrations are quite large enough to permit most people to see clearly how the large outside cylinders are accommodated within the given dimensions.

Both outside and inside connecting-rods line up with their respective crank-pins without resorting to coned wheels, inclining the cylinders at an excessive angle, or placing the coupling-rods outside the connecting-rods. I have not the slightest intention of divulging to either of these correspondents the design features which have overcome the difficulties which they imagine are insuperable.

Complete information relating to the detail design of the "City of Truro" has been given to "L.B.S.C." whose integrity, as the leading authority throughout the world on the design and construction of small steam locomotives, is beyond reproach.

Some of the comments made by the Swindon correspondent reveal a dearth of accuracy. For example, a boiler diameter of 8 ft. 2 in. in conjunction with a grate area of 90 sq. ft. is not by any means a "typical American boiler." The Milwaukee "S2" 4-8-4 with a grate area of 106 sq. ft. has a maximum boiler diameter of 7 ft. 8 in. The Pennsylvania "T1" 4-4-4-4 has a grate area of 92 sq. ft. and a maximum boiler diameter of 7 ft. 6 in. A New York Central "J.3a" 4-6-4 with a grate area of 82 sq. ft. has a maximum boiler diameter of 6 ft. 9 in., and the "Niagara" "S1" 4-8-4 with a grate area of 101 sq. ft. has a maximum boiler diameter of 7 ft. 6 in.

It is not the boiler diameter which determines the amount of smokebox vacuum required, but the net gas area/grate area relationship. The value of this relationship differs widely, as will be seen from the following figures giving the net gas area through the tubes and flues as a percentage of the grate area of the above boilers, "S2" 9.7 per cent., "T1" 9.15 per cent., "J3a" 9.25 per cent., and the "S1" 10.5 per cent. On a "Mallet" type class H-8 2-6-6-6 of the Chesapeake and Ohio, the net gas area through the tubes and flues is as low as 8.6 per cent. of the grate area. The foregoing percentages are all well below the 16 per cent. usual in the gas area/grate area figures obtaining in this country.

It is not necessary to plant a sawn-off culvert on the smokebox to obtain a high smokebox vacuum, with minimum back-pressure. A number of the "Kings" are now equipped with improved draughting arrangements, though the chimney shape and size remain as before.

Yours faithfully,

Taunton. W. B. HOCKINGS.

CROSSHEAD FIXING

DEAR SIR,—The letter of Mr. J. Davies in your issue of August 26th, asks whether it would not be preferable to screw the piston-rod into the crosshead, rather than to fix it with a pin. In my opinion, the answer is a very definite "Yes." My experience of small steam engines has been fairly extensive, and it leads me to believe that *where the design admits*, the best method is to forge rod and crosshead as a unit and fix the piston on a taper with a deep, fine-thread nut, finish-turning the piston when mounted on its rod. This method was adopted by many of the makers of small high-class launch engines in the past.

The best method where the one-piece forging is impracticable is, I think, without question that suggested by Mr. Davies; it was used by Stanley & White for their steam car engines, and I believe, by Noble, too, which is recommendation enough. There are two most important points, relating to construction, to be observed: (1) If possible the piston-rod thread should be screw-cut to ensure accurate concentricity with the axis of the rod; (2) The hole in the crosshead into which the piston-rod screws must have its axis parallel with the guiding surfaces in both planes. Preferably, it too, should be screw-cut but in the smaller sizes, say below 5-in. gauge, this is hardly a proposition for the average amateur. In such cases, it is well worth while to make a special pilot tap and to exercise the greatest possible care to ensure the necessary parallelism.

The fixing of the crosshead by a single pin, whether taper or parallel, is definitely bad practice. If the piston-rod is properly proportioned, say about 1/6 of the cylinder bore in diameter for model locomotive work, then a single pin fixing means, inevitably, that the pin is unduly stressed. If it is attempted to make the pin of anything approaching adequate size, then the metal left in the piston-rod at the sides of the hole becomes quite insufficient to support the stresses to which it is subjected. The late Hy. Greenly adopted a sound and sensible compromise, by using three or sometimes four taper-pins, thus more nearly approaching the orthodox taper-cotter used in full-size practice. There is no reason why in 5-in. gauge and over, the full-size practice should not be followed, using a *tapered* piston-rod end fitting a tapered bore in the crosshead; but if it is, it is necessary that the male and female tapers should be a really good fit, and that the taper holes and the cotter should be accurately cut and fitted; the type of "fitting" which in my shop days, was described as "fitting where it touches," is emphatically not good enough.

Yours faithfully,

Rustington. K. N. HARRIS.

Next Week . . . .

"NETTA"

Valve-gear for the 3½-in. gauge version of this engine is set down in full detail, graphically and verbally.

BRITISH INFLUENCE ABROAD

Interesting photographs and description of some British models built by American readers

A BORING ATTACHMENT

The construction of a traversing boring and facing head, for machining work on the lathe saddle or cross slide, is described by J. Dunn.

"M.E." EXHIBITION REPORT

Attention is given to horological subjects, popular with many readers, and to the miniature locomotive models.

ELECTRIC MOTOR CONVERSION

The limitations of converted motor generators or dyna-motors, for use as electric motors, can be largely corrected by methods of automatic torque and speed control as described by L. Frater.

THE FIELDHOUSE ENGINE

An engrossing description of how an ancient Matthew Murray steam engine was discovered, rescued, dismantled and then re-erected for preservation.

THE BRIGHOUSE EXHIBITION

Our roving correspondent, "Northerner," found several good things to photograph and write about at this excellent show.

IN THE WORKSHOP
BY DUPLEX

Constructing a Small Compressor Unit

THE miniature spray gun described in this journal on February 18th is now largely used both for shading drawings and for retouching photographs, and rather than having to depend on the workshop air-line for a supply of compressed air, we decided to make a small, self-contained compressor unit that could readily be carried from room to room as required.

The compressor itself is a V-twin, having the cylinders of 1 in. bore, and stroke set at an angle of 90 deg. to each other, in order to obtain satisfactory balance of the moving parts.

The cylinders have well-finned, detachable heads and, as a pressure of some 30 p.s.i. is maintained when running at 500 r.p.m., the miniature spray gun, working at 10 p.s.i. to 20 p.s.i., is kept well supplied and the compressor does not tend to become overheated.

The compressor is driven by twin V-belts from a 24 volt electric motor of 1/3 h.p. intermittent rating, which also runs without overheating, as it is only switched on from time to time while the gun is actually in use. Various applications of these small, surplus motors have already been described, and they are still obtainable, we understand, from Mr. Whiston, who advertises in this journal. The motors in question are fitted with a slipping clutch attached to the armature shaft and, when building the compressor, this unit with its ball-bearing is removed from the motor and incorporated in the crankshaft assembly, after the clutch parts have been discarded.

The clutch casing, illustrated in Fig. 3, when bolted to the crankcase, serves as a mounting for attaching the compressor to an angle-plate, and the latter is in turn secured to the baseplate of the machine. The layout of these parts is shown in Figs. 4 and 5. As can be seen in the photographs, both the compressor and the driving motor are mounted on a built-up, angle-iron baseplate to form a compact unit with a self-contained air cylinder, which serves as a carrying handle. As, during spraying, the motor is constantly being switched on and off, an easily operated form of control is a great advantage; in this connection, we hope to describe, later, a mains transformer unit controlled by means of a simple form of foot switch.

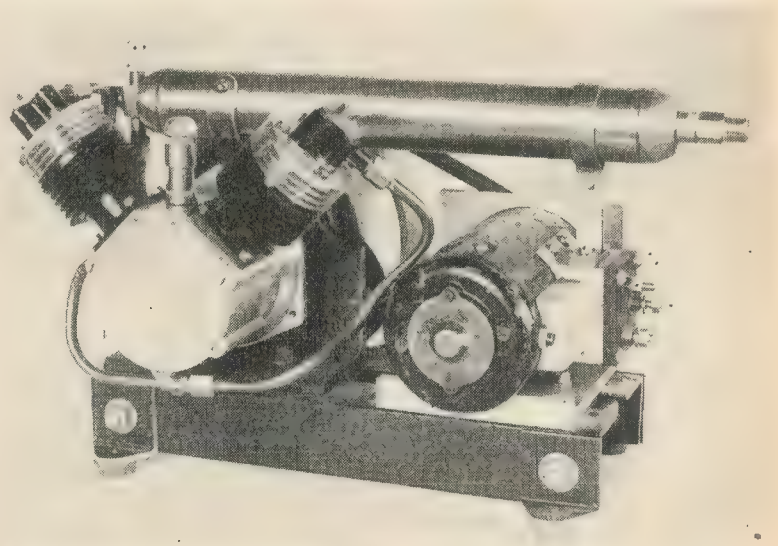


Fig. 1. The finished compressor

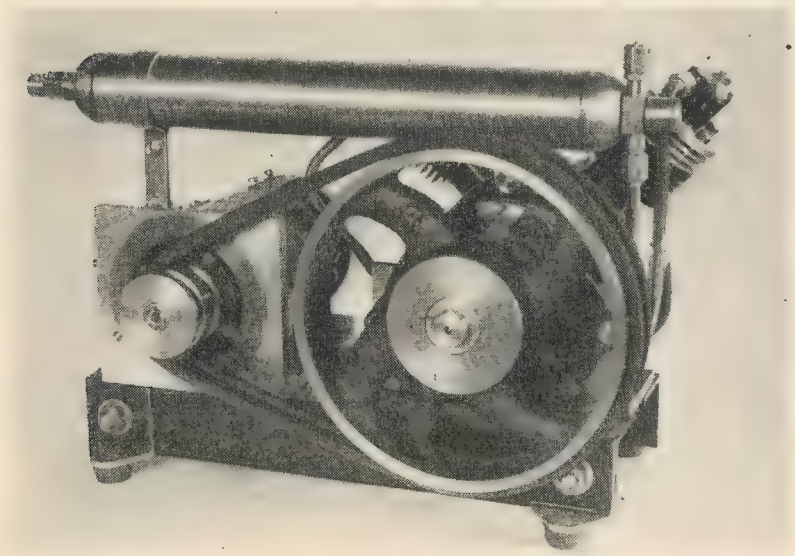


Fig. 2. Showing the motor drive to the compressor

Although, no doubt, a great deal of machining would have been avoided by using castings for the cylinders and crankcase, the following description is of the work actually done when machining the compressor parts from the solid material that happened to be available in the workshop.

The Construction

The crankcase is best made first,

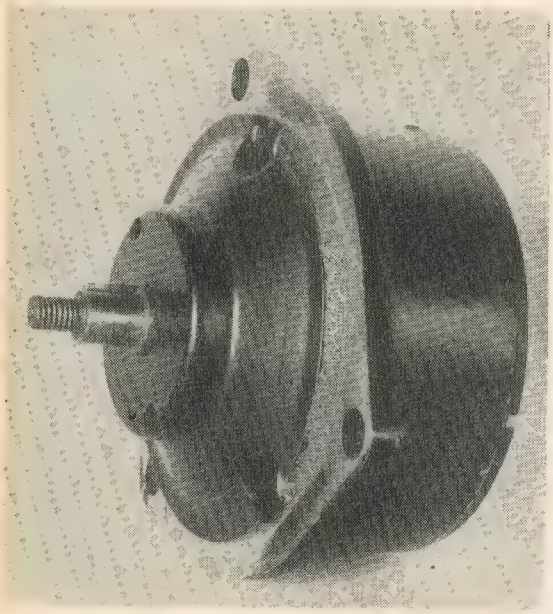


Fig. 3. The clutch casing removed from the motor

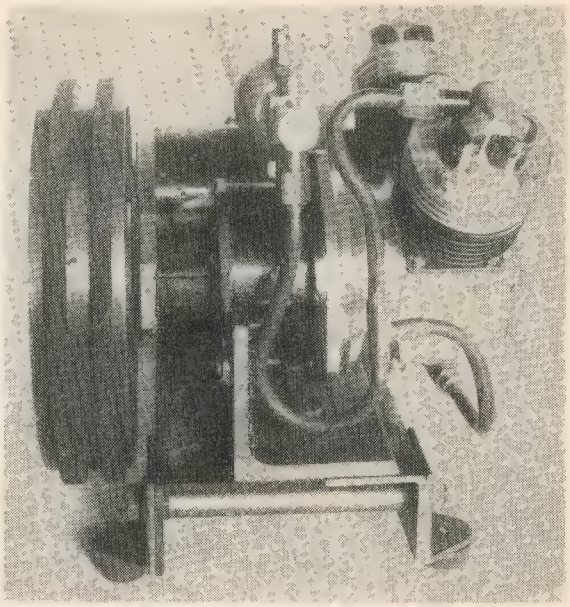
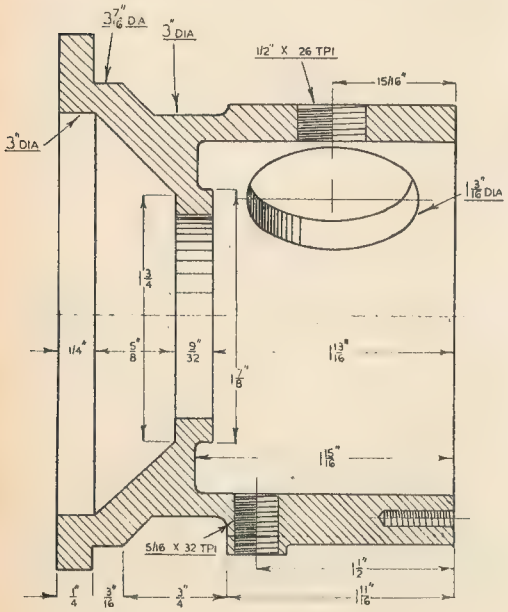
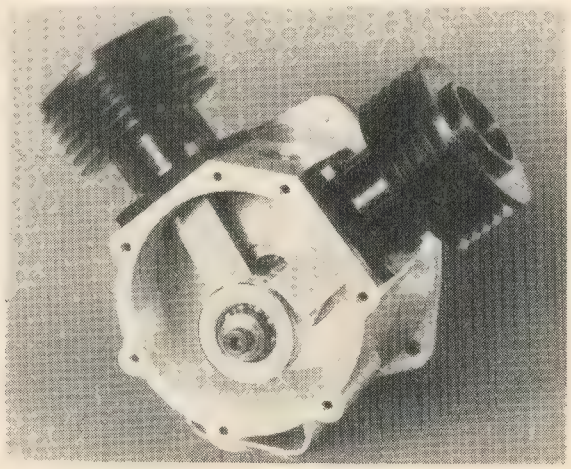
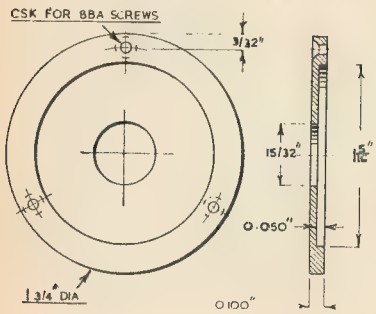


Fig. 4. Showing the clutch casing used for mounting the compressor on an angle-plate





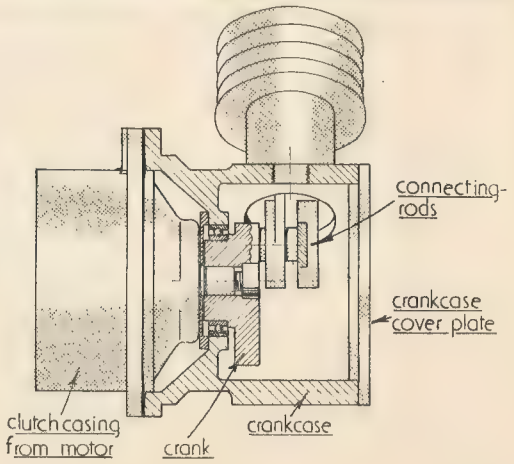


Above left: Fig. 7. The crankcase seen in section

Above right: Fig. 6. The finished crankcase with cylinders in position

Left: Fig. 11. The ball-bearing seal

Right: Fig. 5. Part-sectional view of crankcase mounting



and for this a short length of 4¼ in. diameter duralumin rod was set to run truly in the four-jaw chuck. The mounting flange and the recess were then machined to size, as well as the housing for the ball-bearing. Next, the work was reversed and bolted to the faceplate for machining the interior of the crankcase. In order to machine the seatings for the two cylinders and form the registers for their skirts, the crankcase flange is bolted to an angle-plate attached to the lathe faceplate, and the second seating is aligned from the first with a try-square resting against the faceplate. The flat on the upper surface of the crankcase is machined in the same way and, at the same setting, the hole to receive the breather is drilled and tapped.

As shown in the illustrations, the crankcase has been profile-milled where the screws holding the coverplate are fitted.

In order to do this, it is necessary, first, to centre-drill the screw hole centres. The major curvatures are formed with a round-faced cutter, as shown in Fig. 9, and the machining is carried out by taking a series of traversing cuts and, meanwhile, rotating the work by means of the dividing attachment, engaging with a gear wheel secured to the tail of the mandrel, in accordance with the description we gave in this journal several years ago.

For forming the minor curvatures surrounding the screw holes, the milling is continued with the work off-set so as to bring the centre of each screw hole, in turn, into line with the lathe axis.

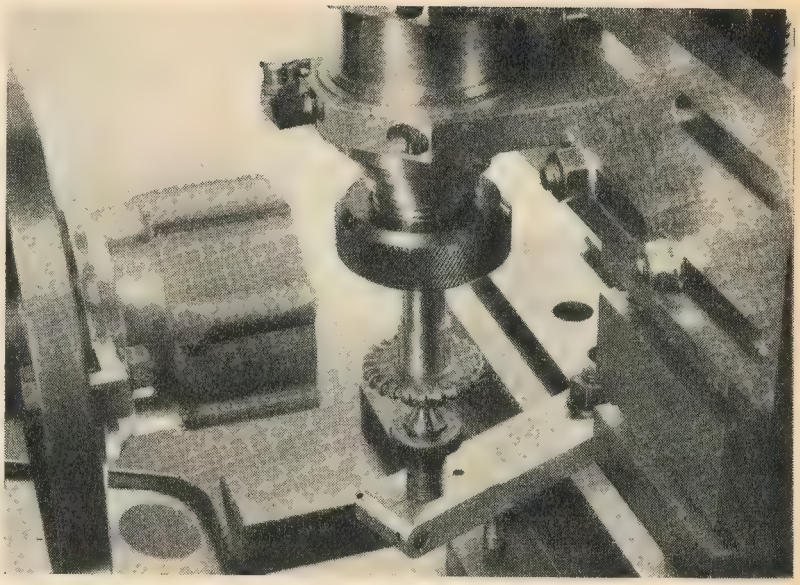


Fig. 9. Profile-milling operation on the crankcase

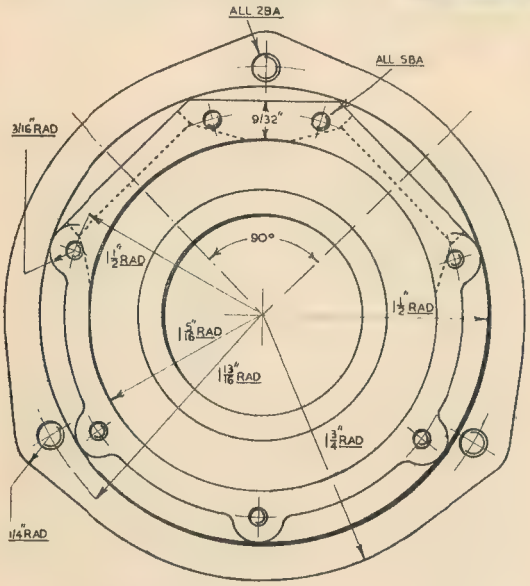


Fig. 8. End view of the crankcase

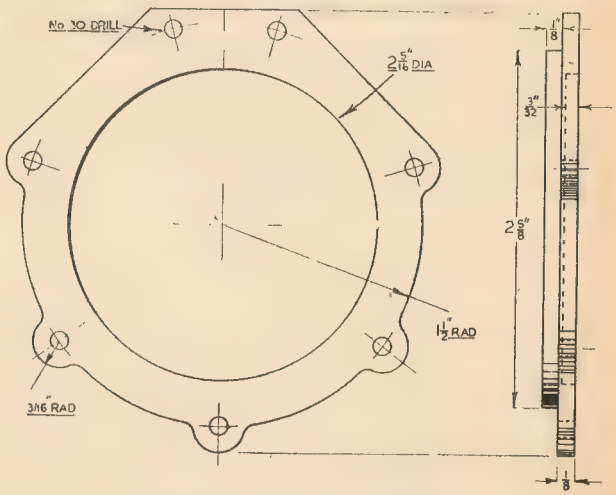


Fig. 10. The crankcase cover plate

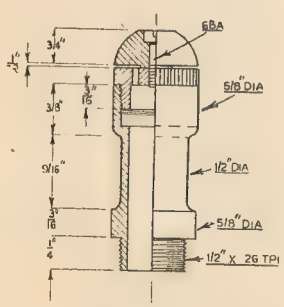


Fig. 12. The crankcase breather

The Crankcase Cover

The material for this part was obtained by parting off a disc from the rod originally used for making the crankcase. The machining is quite straightforward, and the screw holes can be located from transfer marks, obtained by smearing the crankcase face with marking paste and then pressing the cover into place. As can be seen in Fig. 5, a ring is attached to the bearing housing of the crankcase to provide an oil-seal for the ball-bearing.

The Crankcase Breather

This small fitting is also machined from duralumin rod and its purpose is to allow air to pass out of the crankcase but not to enter. This valve action is obtained by fitting a circular disc of shim metal or plastic material between the upper end of the body and the lower surface of the removable cap.

The method of jig-drilling the crankcase for the cylinder bolts will be described in the next instalment.

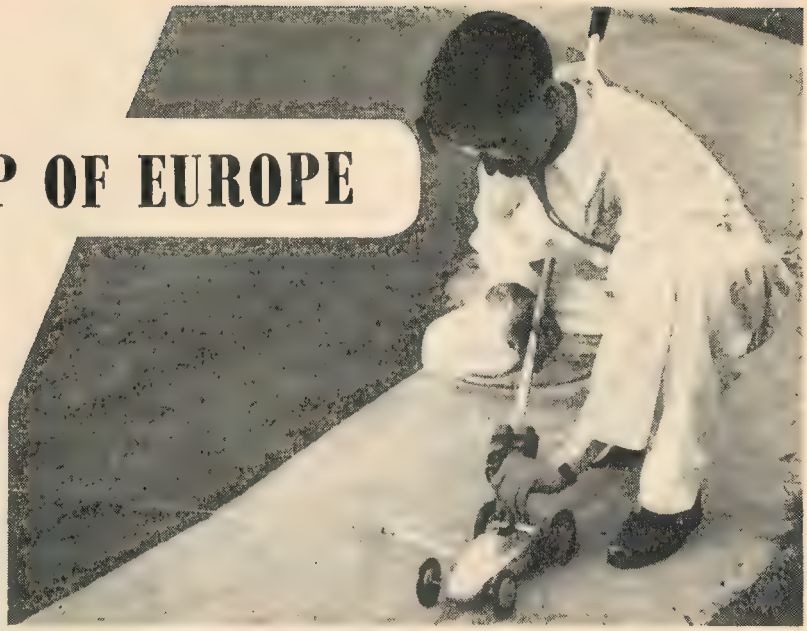
(To be continued)

Geoffrey Deason

Reports on the

CHAMPIONSHIP OF EUROPE

ORGANISED BY THE MODEL CAR ASSOCIATION



The 5 c.c. record-holder, Tom Prest, makes ready for his run with the Z.N.-Dooling Special

IT was a happy choice by the M.C.A. which sited the third model car Championship of Europe at the Woodside track of the Chiltern M.C.C., and the meeting would have been a notable one judged by the weather standards alone. Added to warmth and sunshine in pleasant rural surroundings, however, was a truly international entry and some really close racing in all classes, a total spelling a happy day for a knowledgeable and enthusiastic crowd.

Considerable staff-work had gone to the organisation of the meeting on behalf of the Federation Europeenne du Modelisme Automobile, to give F.E.M.A. its full title, and those who had appreciated the hospitality shown to British teams who had competed abroad in the two previous championships had no reason to feel anything but proud of the M.C.A.'s reciprocal effort. Entries were attracted from Denmark, Germany, Italy, Sweden and Switzerland, to compete with a strong British team selected by stringent eliminating trials held in conjunction with the M.C.A. Regional and Finals earlier in the summer and the visitors not only fielded formidable contenders in each class, but won the most hotly contested by an excitingly narrow margin.

Individual class champions were decided by the best of two quarter mile flying-start runs, whilst place points were totalled to find the class and overall team champions. It was hoped that new records might be established during the day, but weather conditions, although acceptable for spectating, were against really high speeds, as was the somewhat bumpy track surface. Racing commenced in the morning with the 1.5 c.c. class, in which Italy and England only were represented, and it was surprising to find both sides to a man pinning their faith in the potent little Oliver engine ! The home side had the best of things in this category, R. Throwers' Oliver opening with a lovely run at 73.05 m.p.h., a speed approached by none of the opposition, and England's position was consolidated by F. S. Drayson, whose slim and handsome little bevel-drive " Shadow " clocked 73.34 m.p.h., which was to prove the fastest 1.5 c.c. time of the day. Best Italian was A. Miretti's Oliver, with 67.97 m.p.h.

Four nations fought out the 2.5 c.c. class, in which Oliver engines were opposed by the German Webra diesel and four examples of the neat little glow-plugged Super Tigre, the exhaust notes of which gladdened many an enthusiastic ear. Indeed, the Italians, with their Latin verve, " Pirelli " blue overalls and spectacular technique of " throw-starting " their models, added no little to the gaiety of the occasion, the launching of each model being accompanied by the maximum of energy, noise and excitement ! M. Eiraudo's entry, handled in his absence by Casetta, set the pace with a rasping first run at 77.25 m.p.h., to which R. Salamon's Webra failed to reply, for Switzerland, and Lallinger for Germany, also using the Webra motor, could only counter with 61.98 m.p.h. Philip Rochat put Switzerland back in the running with 76.20 m.p.h. from his neat white and red Oliver, expertly handled, and B. Benazzi's Tigre-powered Special managed 72 m.p.h. It was left to England's No. 1 man, F. S. Drayson, to crack the eighty mark, the little 2.5 c.c. " Shadow," strangely quiet after the howl of the glow-plug jobs, achieving this with 1.08 m.p.h. to spare in a most impressive run. This, as it transpired, put Class 2½ in the bag for England before the luncheon break, a feat backed up by 76-plus runs by the

Mrs. J. C. Cook, wife of the M.C.A. Chairman, presents the 5 c.c. Championship Cup to Casetta

Olivers of Ray Flower and Tom Prest.

The 5 c.c. class brought out several very fast Dooling jobs, including Tom Prest's 100 m.p.h. Z.N. Special record holder, to mix it with three Super Tigres, E. Thorpman's McCoy and A. Bishop's ETA Rochat (Dooling) opened with 80.86 m.p.h., A. Lallinger's Dooling stopped during its warming up laps and ran out of time before its perspiring owner diagnosed a burnt-out glow-plug, which he hurled over a hedge with disgusted cries of "Kaput," and Thorpman's Dooling did not record a run. Great things were expected of Prest, and his first run at 94.04 m.p.h. looked hard to beat. Benazzi's Supre Tigre sounded very fast, and showed that the Italian "Five" was to be reckoned with, in a fine run at 89.19 m.p.h., and then followed a series of "no-runs" by Swiss, English and Italian cars. Last but one came Casetta, his pretty blue wind-defeating car relying on a Dooling motor, which started without hesitation and sounded in magnificent trim. Waiting so long before signalling for "Time-in" that one expected the fuel to run out at any moment, he judged his moment to perfection, and rousing applause greeted his speed, 95.03. Could our last man, Jack Cook, better it? The ex-record holder really turned it up, and it was anybody's guess until the time-keepers gave out "94.73 m.p.h."! Great was the jubilation amongst the blue-overalled Italians, as attention turned to the 10 c.c. speed-irons; the first runs of which completed the morning programme.

In this category ten Dooling-engined models were opposed by four McCoys, a Hornet and a solitary Komet from Denmark, England's four champions relying entirely on the first-named motor. On paper their chances looked good, their most menacing rival being E. Thorpman, with both McCoy and Dooling entries. This young Swede, a flight-engineer with one of the Swedish air-lines, has had wide racing experience both in Europe and America, and came to Woodside with a formidable reputation, whilst Philip Rochat's Swiss entry was another "possible." P. Mancini's entry, run by proxy, started ball rolling with 100.78 m.p.h., after some slight misunderstandings regarding starting procedure had been smoothed out, H. Waeffler of Switzerland failed to start, then Thorpman clocked 108.43 with his "tear-drop" McCoy. Now came Jim Dean's famous Dooling, remembered for its fine performances at Monza and in the British Nationals, and after a sulky start, energetically pushed by Tom Prest and Alec Snelling in turn, the little green tornado put in a screaming run to record a brilliant 117.95 m.p.h. Neither Prest nor Thorpman could approach this figure, B. Hasseldam (Denmark) could only manage 94.53 with his old-type McCoy Teardrop, whilst his compatriot A. Laurensen with the Komet failed to reach the eighty mark. The British chances looked bright indeed when Bill Hamilton chalked up another tremendous run with his Dooling, a bare 0.31 m.p.h. below Dean's speed, whilst poor F. C. Petrie, had to scratch his car due to starting troubles. Thus at half time

F. J. Dean (left) watches his 10 c.c. entry made ready on the line prior to its championship winning run. Alec Snelling stands by to push-start the model

Italian conqueror of the 5 c.c. class, A. Casetta, prepares to start his run. Note the battery and plug-in lead for the glow-plug ignition

E. Thorpman, Swedish and international model racing star, at work on a 10 c.c. car in the pit

England led three of the four classes, with Italy on top in the 5 c.c. event.

Temperatures dropped slightly after lunch, and one by one the 1.5 c.c. models recorded lower speeds than in the morning, an exception being Ken Proctor, who had failed to start in the first round, but came back well with 69.87 m.p.h. (his starting push being a model of nonchalance and brevity !), and class leader F. S. Drayson, who made victory doubly sure with an exact repeat of his morning's performance. Much the same story unfolded during the second runs of the 2.5 c.c. jobs, a notable exception being England's R. Thrower, whose Oliver notched up 78.32 m.p.h., a shade better than Drayson's second effort, R. Salomon (Switzerland) whose Super Tigre managed 67.41 m.p.h., and Tom Prest, with a modest increase of 0.2 m.p.h. Another class championship thus fell to England.

With Italy leading in the 5 c.c. class, there was feverish activity in the English pit, and after Rochat had returned 83.10 m.p.h., Prest succeeded improving on his earlier run with 94.73 m.p.h. Good, but not quite good enough ! B. Benazzi's second effort was fractionally slower than his first, A. Bishop, running the only British engined car above 2.5 c.c., now scored a good 90.18 m.p.h. with his ETA Special, and A. Miretti displayed immense verve in getting his Dooling away to clock 89.64 m.p.h. After W. Hurn (Z.N. Dooling) had recorded his only run (84.90 m.p.h.), Casetta brought his car to the line, and amid considerable excitement, failed to reach his earlier speed by nearly three m.p.h. Englands fate now depended upon Jack Cook, but honours remained with Italy as his time was announced as 9.69 sec., or 92.87 m.p.h.

Finally came the 10 c.c. class second round, in which interest centred round the Dean-Hamilton struggle, and the possibility of Thorpman finding his true form to score a last-minute Swedish victory. His run with the McCoy was a bar 1 m.p.h. faster than his morning run, and his last hope departed when his Dooling siezed up without recording a time, truly bad luck after a sporting effort. Jim Dean's Dooling could not reproduce its earlier form, but as things turned out, was able to rest on its laurels, for the non-starting jinx got at four of the last five runners in the class, including the unfortunate Bill Hamilton, who was unable to bring his car to the start within the stipulated minute, and was thus deprived of the opportunity to squeeze out the odd half mile per hour between him and the 10 c.c. championship.

Thus ended the third European Championship, an excellent event marked by first-class organisation on the part of the track officials, Messrs. Cyril Catchpole, George Thornton, E. P. Zere and Ian Moore, and a spirit of good-fellowship amongst competitors.

RESULTS

10 c.c. CLASS

	Name	Country	Motor	Speed 1st	Speed 2nd
1.	F. J. Dean	England	Dooling	**117.95**	113.92
2.	W. Hamilton	England	Dooling	**117.64**	N.R.
3.	T. Prest	England	Dooling	**110.83**	110.02
4.	E. Thorpman	Sweden	McCoy	**110.42**	N.R.
5.	E. Thorpman	Sweden	McCoy	108.43	**109.48**
6.	E. Thorpman	Sweden	Dooling	**108.56**	106.00
7.	P. Rochat	Switzerland	Dooling	101.69	**104.65**
8.	Carugati	Italy	McCoy	97.82	**103.68**
9.	L. Castelbarco (Proxy Carugati)	Italy	Dooling	N.R.	**102.50**
10.	Mancini (Proxy Carugati)	Italy	Dooling	**100.78**	N.R.
11.	M. Allemano	Italy	Hornet	51.99	**96.98**
12.	B. Hasseldam	Denmark	McCoy	**94.53**	**94.14**
13.	H. Waeffler	Switzerland	Dooling	N.R.	**94.14**
14.	A. Laursen	Denmark	Komet	**78.53**	N.R.
	F. C. Petrie	England	Dooling	N.R.	N.R.

Team Positions

1. England ... ... 700 points
2. Sweden ... ... 296 points
3. Italy ... ... 93 points

5 c.c. CLASS

	Name	Country	Motor	Speed 1st	Speed 2nd
1.	Casetta	Italy	Dooling	**95.03**	92.21
2.	J. C. Cook	England	Dooling	**94.73**	92.87
3.	T Prest	England	Dooling	94.04	**94.73**
4.	A. Bishop	England	Eta	N.R.	**90.18**
5.	A. Miretti	Italy	Dooling	N.R.	**89.64**
6.	B. Benazzi	Italy	Super Tigre	**89.19**	87.97
7.	W. Hurn	England	Dooling	N.R.	**84.90**
8.	P. Rochat	Switzerland	Dooling	80.86	**83.10**
	A. Lallinger	Germany	Dooling	N.R.	N.R.

Team Positions

1. Italy ... ... 527 points
2. England ... ... 525 points
3. Switzerland ... 53 points

2·5 c.c. CLASS

	Name	Country	Motor	Speed 1st	Speed 2nd
1.	F. S. Drayson	England	Oliver	**81.08**	78.19
2.	R. Thrower	England	Oliver	72.23	**78.32**
3.	M. Eiraudo	Italy	Super Tigre	**77.25**	75.44
4.	T. Prest	England	Oliver	76.59	**76.79**
5.	P. Rochat	Switzerland	Oliver	**76.20**	74.50
6.	R. W. Flower	England	Oliver	**76.07**	N.R.
7.	B. Benazzi	Italy	Super Tigre	**72.00**	70.09
8.	Bono (Proxy Miretti)	Italy	Super Tigre	**69.23**	58.17
9.	R. Salomon	Switzerland	Super Tigre	63.92	**67.41**
10.	A. Lallinger	Germany	Webra	**61.89**	60.97
11.	R. Salomon	Switzerland	Webra	N.R.	**51.04**
	Cirani	Italy	Super Tigre	N.R.	N.R.

Team Positions

1. England ... ... 700 points
2. Italy ... ... 296 points
3. Switzerland ... 167 points
4. Germany ... 30 points

1·5 c.c. CLASS

	Name	Country	Motor	Speed 1st	Speed 2nd
1.	F. S. Drayson	England	Oliver	73.34	**73.34**
2.	R. Thrower	England	Oliver	**73.05**	71.71
3.	K. Proctor	England	Oliver	N.R.	**69.87**
4.	A. Miretti	Italy	Oliver	**67.97**	66.86
5.	P. R. Eaves	England	Oliver	59.48	**67.61**
6.	V. Carugati	Italy	Oliver	**40.54**	35.65
	M. Paiuzzi (Proxy Miretti)	Italy	Oliver	N.R.	N.R.

Team Positions

1. England ... ... 700 points
2. Italy ... ... 264 points

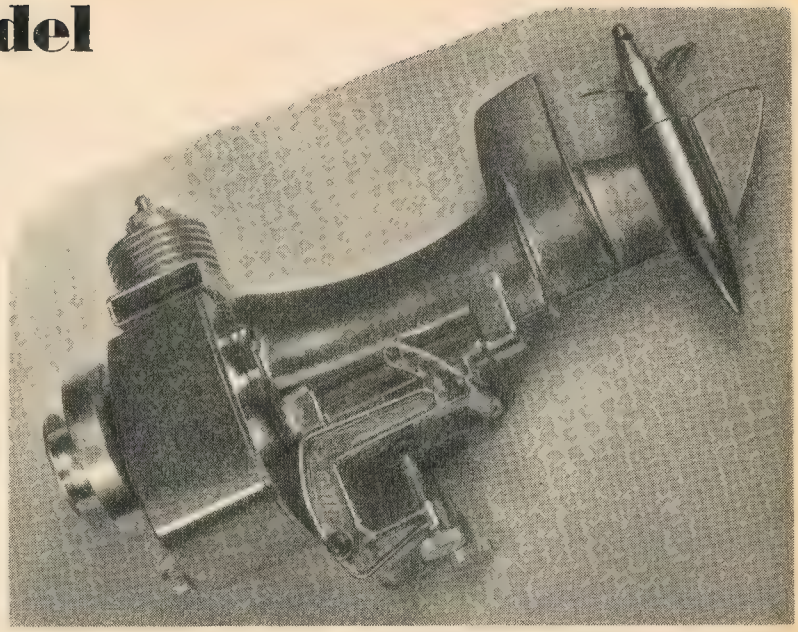
NATIONAL TEAM TROPHY

1. England ... 2,625 points
2. Italy ... 1,180 points
3. Switzerland ... 304 points
4. Sweden ... 296 points
5. Germany ... 30 points
6. Denmark ... 26 points

Notable Model I.C. Engines

THE ALLYN SEA-FURY OUTBOARD

By P. G. F. Chinn



SINCE the advent of glow-plug ignition in the U.S.A. some seven years ago and the subsequent introduction of some really small model aircraft engines—notably the " Half-A " class of 0.049 cu. in. (0.8 c.c.)—there has been an immense increase in the popularity of miniature internal-combustion engines in America. These small, easy-to-handle units, mass produced at prices ranging from a mere 30 shillings retail, have opened up entirely new markets by bringing power models to a younger and less skilled section of the hobby and hundreds of thousands of these little engines are now sold annually.

Thus, with, as a basis, a sound, economically-produced and suitably dimensioned power head ready made, it was, perhaps, inevitable that American manufacturers would eventually produce a true model outboard motor. There have, of course, been outboard engines of the electric type available for model boats, but the Allyn and Atwood outboards recently put on the market in the U.S.A. are the very first commercially produced true model outboard i.c. engines.

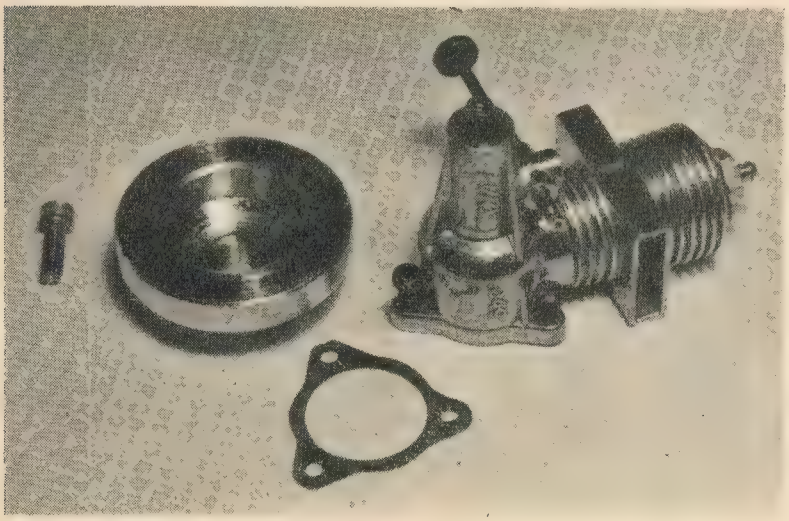
The initial impression one gets on first inspecting the Allyn Sea-Fury is one of pleasant surprise. First, there is the quite stunning realism of the unit; secondly, there is the excellently finished die-casting which adds to its attractive appearance and, thirdly, there is its light weight.

The power head of the Sea-Fury consists of a 0.049 cu. in. air-cooled glow-plug ignition unit basically identical with the Allyn Sky-Fury model aircraft engine. This is based on a somewhat complicated pressure-die casting in aluminium alloy which embodies crankcase, cylinder barrel, twin exhaust ducts, main bearing, carburettor body and radial mounting flange. The Meehanite cylinder liner is then locked in position by the plug-type cylinder-head which screws into the top of the cylinder barrel. Cylinder porting consists of two large exhaust ports diametrically opposed, while transfer ports and passages are combined in the form of twin grooves, front and rear, in the lower part of the bore. The improved lubrication that this provides for the piston, is facilitated by the fact that a ball-and-socket type small-end joint is employed, in place of the usual gudgeon-pin, and this allows rotation of the piston within the bore.

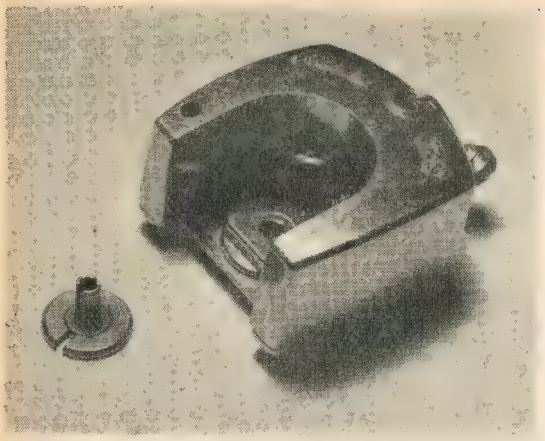
Both piston crown and cylinder-head, incidentally, are flat, whereas most units of this class use conical or domed surfaces. Another quite unusual feature is the design of the glow-plug element, which is in the shape of a " W " placed vertically within the glow-plug cavity, instead of the common wire coil.

The crankshaft is hollow throughout its length, the front end being sealed by means of the flywheel retaining-screw, while the inner section forms the gas passage from the shaft intake type rotary-valve port. The front end of the shaft is tapered and the lightweight aluminium flywheel fits on to this. The flywheel has a pulley machined integrally with it for the starter cord, and the rear face of the flywheel is suitably recessed to reduce overhang to a minimum.

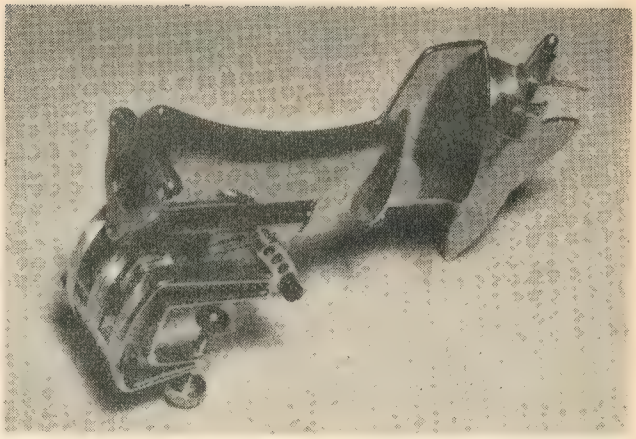
Adding much to the appearance of the Sea-Fury is the large pressure-die-cast fuel tank which surrounds the crankcase. This has a bottom plate which also embodies the crankcase backplate



The 0.8 c.c. power head which is based on model aircraft engine practice, and showing the recessed flywheel



The fuel tank and crankcase cover plate assembly, with the drive coupling removed



The complete lower end assembly enclosing the drive shaft and bevel gear system. Note the swivelling transom clamp which is also adjustable for planing trim

and carries the bearing supporting the short drive coupling between the crankshaft and vertical drive shaft. The coupling consists of a disc having a slot in its periphery which engages an extension on the crankpin. Rotation is then conveyed to the vertical drive shaft by means of a simple tongue-and-slot coupling.

The lower end housing is another excellently finished and realistically shaped die-casting and includes a streamlined bevel-gear housing, cavitation plate and skeg. The rear of the bevel gear housing is suitably threaded to take the propeller shaft gland which is of bronze and is nickel plated. The bevel gears, which are of hardened steel, provide a 1 : 1 ratio and, from our tests, it would appear that propeller speeds substantially exceeding 12,000 r.p.m. are realised under load. The screw is a two-bladed type of $\frac{7}{8}$ in. diameter and is locked on the shaft by means of a conical streamlined nut.

A most attractive feature of the Sea-Fury is its scale type mounting bracket assembly. This consists of a die-cast swivel bracket and twin die-cast clamp brackets fitting on to the transom of the boat in the authentic manner. The clamp brackets are positioned by means of a five-position quadrant and a spacer which provide adjustment for the planing trim of the boat.

One basic departure from model aircraft practice was to revise the crankshaft porting to provide clockwise rotation. Thus, a left-hand screw is used. Both left-handed and right-handed rotation is, of course, used in full-size practice.

The Allyn Sea-Fury, we found, started very easily. The unit was clamped on a simple test rig which submerged the propeller, and a fuel consisting of 50 per cent. methanol, 30 per cent. castor-oil and 20 per cent 2-nitropropane was put into the tank. After replacing the original plastic fuel line, which was kinked and was restricting fuel flow, we had the motor running within two or three pulls of the starter cord, following priming.

This unit, being of U.S. manufacture, is not, of course, generally available in this country, but it is more than probable that, if the promised demand for miniature outboards also materialises elsewhere, British model engine manufacturers will soon follow suit. Meanwhile, the Allyn Sales Co., Inc., of 6425 McKinley Avenue, Los Angeles, California, who have produced the Sea-Fury at the exceedingly modest price of $9.95, are to be congratulated on a fine effort.

"BELVEDERE SMITH"

A Tribute by Edgar T. Westbury

ONE of our Australian visitors at the "M.E." Exhibition bore to us the sad news of the passing of a notable model engineering pioneer, Mr. W. J. Smith, whose work in the development of model petrol engines and power boats in the first decade of the century will long be remembered. The first mention of his name in THE MODEL ENGINEER appeared in 1908, when he took part in the first regatta ever held in this country, as a member of the Victoria Model Steamboat Club; his petrol-driven boat *Belvedere* won third place in a race over a course of 144 yards, at a speed of 5.11 miles per hour.

This race, it may be noted, clearly demonstrated the possibilities of small petrol engines for boat propulsion, and Mr. Smith found the demand for such engines great enough to justify setting up a business to manufacture them. The engines became known as the "Belvedere" engines—some of them, by the way, are still running today—and the name was also applied to their designer. They were of the four-stroke type, water-cooled, with automatic inlet valves, very heavy and slow-running according to modern ideas, but certainly reliable. They were usually installed horizontally in the boat, with the shaft vertical, and driving the propeller through bevel gearing; this method of installation is still used by some of the "old school," a notable example being the famous *Leda III* by Mr. E. W. Vanner.

A few years later Mr. Smith emigrated to Australia, and set up a factory for the production of bolts, nuts and screws, which flourished to such an extent that he became regarded as a pioneer of industry in that vast country. His interest in model engineering, however, was never extinguished, and he played an important part in the encouragement of model societies, including the famous Sydney S.M.E., which owes a great deal to his patronage and assistance.

On the occasion of a visit to this country shortly before the war, Mr. Smith made a point of visiting Victoria Park and witnessing a regatta, where he was very thrilled with the modern developments in the speed and performance of the boats and he donated a trophy to the M.P.B.A. for their further encouragement. A good deal of water has flowed through the slipstreams of propellers since Belvedere Smith and his colleagues first started building model boats, and enormous strides have been made in their design and performance; but let us not forget that had it not been for their untiring efforts, these things might never have happened.

News of the Trade

● THREE NEW ITEMS OF ELECTRICAL EQUIPMENT SUITABLE FOR THE MODEL ENGINEERS' WORKSHOP

WE have recently examined and tested two useful electrical appliances which have been developed by Scope Laboratories, of Melbourne, Australia, and are now available in this country. The first of these is a low-voltage, rapid-heating soldering-bit, which has many applications in model engineering and electrical work. It can be energised from a 4- or 6-volt accumulator, if the latter has ample current capacity, but the normal source of supply is a 100-watt transformer which works from a.c. mains, and is equipped with a holder to take the bit when not in use.

The heating element consists of a small carbon resistance enclosed within the hollow copper bit, and it is controlled by a spring-loaded ring switch in the handle, so that current is consumed only when it is actually in use. The bit heats up to soldering temperature in 6 sec. Both the hollow bit and the heating element are readily renewable, and replacements are relatively inexpensive as compared with high-voltage soldering irons. Two spare elements and one spare tip are available with each iron, and it is fully guaranteed for three months from the date of purchase.

The second item is an ingenious electro-plating device for small work, the current for which is obtained from a dry battery enclosed in the tubular handle of a brush which serves as the anode and is connected to the positive contact of the battery; a flexible lead from the negative side terminates in a clip which is connected to the work, thus forming the cathode. The set contains a supply of chemical solutions for depositing various metals, including gold, silver, nickel and copper, together with a cleaner which is used to ensure that the metal surface to be treated is perfectly free from dirt, grease and tarnish.

Any metal with the exception of aluminium can be plated, and as the process is purely electrolytic, as distinct from chemical reaction, it produces a deposit of pure metal of a thickness dependent on the time during which it acts on a given area, in conjunction with the applied current. This deposit is permanent, subject only to the effects of wear or abrasion.

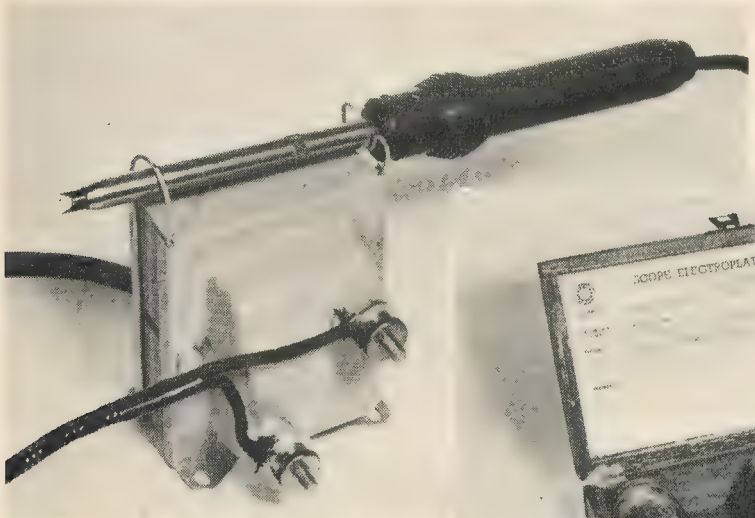
Concessions for the sale of " Scope " electrical appliances have been obtained by wholesale factors in this country, sole marketing rights for the soldering-bit being held by Enthoven Solders Ltd., 89, Upper Thames St., London, E.C.4, and the sole rights for the electro-plating set by Messrs. L. E. Simmons Ltd., 5, Byron Road, Harrow, Middx.

Brook Electric Grinders

Particulars have been received of the Brook electric grinders, which are available in voltages from 200 to 250 single-phase, and 400 to 450 three-phase a.c., with double-ended spindles to take 6-in. or 7-in. wheels. The motors are of the totally-enclosed type, running at 2,850 r.p.m. under load, mounted on cast-iron base incorporating a heavy duty on-off switch. Wheel guards, adjustable tool rests and spark arresters are fitted, together with dust-proof bearings, and one coarse and one fine wheel is supplied with each machine. Accessories available include taper spindle ends, screwed right- and left-handed to take polishing mops, and a cast-iron pedestal for floor mounting, complete with two shelves and a water trough.

Correction

We regret that in the advertisement of Messrs. S. H. Muffett, in our August 19th issue, the price of the Worm Reduction Gearbox in dural case is shown as £2 15s. 6d., instead of the correct price, which is £3 15s. 0d.



Above: The Scope Superspeed soldering iron with its transformer

Right: The electroplating set, showing battery holder with brush, and plating chemicals

QUERIES AND REPLIES

"THE M.E." FREE ADVICE SERVICE. Queries from readers on matters connected with model engineering are replied to by post as promptly as possible. If considered of general interest the query and reply may also be published on this page. The following rules must, however, be complied with:
(1) Queries must be of a practical nature on subjects within the scope of this journal.
(2) Only queries which admit of a reasonably brief reply can be dealt with.
(3) Queries should not be sent under the same cover as any other communication.
(4) Queries involving the buying, selling, or valuation of models or equipment, or hypothetical queries such as examination questions, cannot be answered.
(5) A stamped addressed envelope must accompany each query.
(6) Envelopes must be marked "Query" and be addressed to THE MODEL ENGINEER, 19-20, Noel Street, London, W.1.

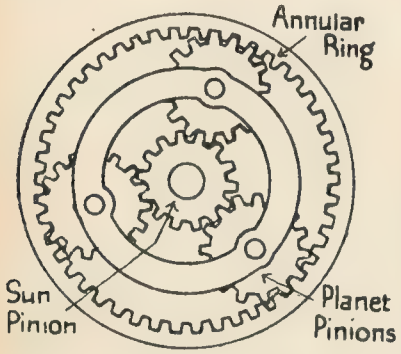
Sun and Planet Gear

In the handbook "1,001 Mechanical Facts Made Easy" by Percival Marshall, a reference is made to "'sun and planet gear." Could you please advise me of any manufacturers of units of this type?

G.T.D. (Olivos, Argentina).

Sun and planet gear, or epicyclic gear, as it is usually termed, is incorporated in speed reduction and changing mechanism for automobile, marine and machine tool work, but we do not know of any firm making such gearing as entirely separate and distinct units.

You might possibly be able to obtain some further information on the matter from a firm specialising in transmission equipment, such as Messrs. Crofts (Engineers) Ltd., of Thornbury, Bradford.



Materials for I.C. Engine Construction

I am a newcomer to model engineering and am mostly interested in the construction of i.c. engines. Will you please advise me of sources of supply of the following items:—

(a) castings to my pattern, alloys and iron.

(b) cylinder liner material (molybdenum, chrome, etc.).

(c) Lo-ex piston material—or bar stock equivalent.

(d) Dural and alloy stock.

(e) Gear cutting, or ranges of standard gears to choose from.

(f) High tensile steel stock, nickel-chrome, etc.

R.H.B. (Brighton).

We would point out that retail supplies of special materials are difficult to obtain, and there are many materials for which we know no source of supply.

(*a*) castings, either in iron or non-ferrous alloys of all kinds, can be made to your own patterns by the following firms:—

W. H. Haselgrove, 1, Queensway, Petts Wood, Kent.

Dick Simmonds, 5, South Road, Erith, Kent.

Kennion Bros., 9, Greenways, Hertford.

(*b*) Special alloy irons for cylinder liners cannot, so far as we are aware, be obtained in retail quantities. Manufacturers of these alloys are:—

Sheepbridge Stokes Co. Ltd., Chesterfield.

Wellworthy Piston Ring Co. Ltd., Lymington, Hants.

British Piston Ring Co. Ltd., 1, Percy Buildings, Gresse Street, W.1.

(*c*) and (*d*) Lo-ex piston material, and dural and other light alloys, can be obtained from H. Rollett & Co., 5, Chesham Place, London, S.W.1.

(*e*) Ranges of standard gears can be obtained from Bond's o' Euston Road Ltd., 357, Euston Road, London, N.W.1, and Muffett Ltd., Mount Ephraim Works, Tunbridge Wells, Kent, who will also undertake to cut gears to special order.

(*f*) We know of no retail supplier of high tensile steels.

Engine for Driving Generator

I wish to build an i.c. engine to run a generator with an output of 24 volts d.c. at about 12 amps. Space limitations in the project impose maximum dimensions of 5½-in. overall height and overall width of 5-in., length being unimportant, but up to 15-in. maximum.

Can you advise me (a) if the 30 c.c. "1831" engine or the "Kittyhawk" 30 c.c. would be capable of dealing with the load? (b) If the same engines could be suitably coupled in pairs in line? (c) any further engine or suggestions for a suitable engine?

D.A.A. (Burton-on-Trent).

The output of 24 volts at 12 amperes (288 watts) would require practically 1 h.p. to drive it at full load, allowing for electrical and mechanical losses.

Neither of the two engines mentioned, namely the 30 c.c. "1831" engine, nor the 30 c.c. "Kittyhawk" engine, are designed for continuous work of this nature, and we do not recommend coupling two engines in line as you suggest, owing to the difficulty in ensuring that the engines will share the load equally.

An engine intended for continuous stationary work should have much larger bearing surfaces than engines which are built for short intermittent runs. An engine such as the "Busy Bee" would be much more suitable, but the continuous rating of this engine is only approximately ½ h.p., and we should not expect it to be capable of producing the wattage you require for the full generator output.

We suggest that if you wish to obtain a ready-made engine, the small 1 h.p. J.A.P. engine would be suitable. This engine can be obtained from some of our advertisers dealing with ex-service apparatus. No available engine that we know of, however, would conform to the space limitations which you specify.

Micrometer Reading

I have your book on "Micrometers and Slide Gauges" which I have found very helpful.

However, I just cannot see how to read and set my micrometer to the decimal equivalents of fractions such as 13/64 in. =0.203125 or 3/64-in. = 0.046875. Can you please advise me how to set the micrometer to these decimal measurements?

S.S. (Redruth).

The standard type of micrometer is calibrated to work down to increments of one thousandth of an inch, and although an experienced operator can estimate somewhat finer limits by working between the marked positions, we consider that, as you are a beginner, it would be advisable to obtain proficiency in working to one thousandth limits first.

To quote the examples given, the nearest reading for 13/64 would be 0.203 and 3/64 would be 0.047. Generally speaking, for any finer limits than this, a micrometer fitted with a Vernier for accurate measurement of increments of one ten-thousandths of an inch is advisable, and this is the finest limit that you would be likely to have to work to in ordinary engineering practice.

Burnerd "Griptru" Chucks

With reference to our review of the above chucks, in the issue dated September 2nd, we are advised by Messrs. F. Burnerd & Co., that our statement in respect of slackening the tie-bolts before operating the micro-adjustment is incorrect. It is in fact unnecessary and undesirable to slacken these bolts, and no great force is necessary to operate the adjusting screws, so that the bursting stress on the chuck body is negligible.

WITH THE CLUBS

South London M.E.S.

The next meeting of the society will be held on Sunday, October 3rd, at the White Horse Hotel, 94, Bresdon Hill, London, S.W.2, at 11 a.m. This will be a rummage sale, and all members are therefore asked to turn out those bits and pieces and bring them along for sale.

This season has been a very strenuous time for the locomotive section, who have been out with the track and locomotives every week-end and members are now asked to help with over-hauling the track and equipment.

The programme for the coming winter meetings is now being arranged and suggestions from members will be welcomed.

There are still one or two vacancies in the club for unattached keen model engineers and full particulars can be obtained from the Hon. Secretary; W. R. Cook, 103, Engleheart Road, Catford, London, S.E.6.

Eltham & District Locomotive Society

The next meeting will take place at the Beehive Hotel, Eltham, at 8.0 p.m. on Thursday, October 7th, 1954. This will be a very special night, as our chairman, Mr. Hutton, has promised, provided transport is available, to bring along his 3½-in. gauge "Princess" locomotive of which the society is very proud to announce was awarded a silver medal in the locomotive class, and the Dr. Bradbury Winter Cup for the best piece of work in the show at the "M.E." Exhibition.

This beautiful piece of craftsmanship is worth making a special effort to see, and Mr. Hutton will give a talk on its construction. Members are asked to make a very special effort to attend this session.

At the last meeting, Mr. Hereforth gave his talk for lathe work and went very thoroughly into the subject of lathe tools and their uses. He acquitted himself very well for his first talk to the society, and proved to be a very fluent speaker.

Visitors are always cordially invited to the meetings.

Hon. Secretary: F. H. Bradford, 19, South Park Crescent, S.E.6.

The Stephenson Memorial Miniature Locomotive Association

A meeting will be held at the Vane Tempest Hall, Durham, at 3.0 p.m. on Saturday October 2nd, 1954, to discuss matters arising from the first Locomotive Rally which was held at Roker Park, Sunderland, recently, together with other matters relevant to the running of small gauge locomotives.

J. W. Carter, 28, East Avenue, Billingham, Co. Durham.

North London Society of Model Engineers

At the September general meeting, interest was taken in the forthcoming Exhibition to be held at Ewen Hall, Wood Street, Barnet, September 28th to October 2nd.

Mr. Baldock had his new bench drilling machine on view and gave a very interesting description of how he constructed it. This was followed by Mr. Weaver with his Sunbeam car, which he was building to be an exact copy of same at the time the prototype was driven at 150 miles per hour by Malcolm Campbell in 1924.

Mr. Brookes then produced his microscope, which was a very fine piece of work, following closely Mr. Sparey's. The meeting was held by courtesy of the Eastern Gas Board at their office in Station Road, New Barnett.

Hon. Secretary: W. W. Ransom, 6, Arundel Court, 127, Woodhouse Road, N.12.

Grimsby and District Society of Model and Experimental Engineers

The above society will be holding their bi-annual exhibition in St. Aidans Church Hall from October 19th to 23rd, and have this year included two new classes, namely—ladies handicrafts and handicrafts by school-children, in addition to the usual classes for locomotives, traction engines, stationary engines, c.i. and i.c. engines, cars, ships, aircrafts and handicrafts. The mobile locomotive track will be in operation for rides, throughout the exhibition, and refreshments will be available during the afternoon and evenings.

Hon Secretary: H. C. Emmerson, 30, Baytree Avenue, Grimsby, Lincs.

The Ilford and West Essex Model Railway Club, with their 7¼-in. gauge L.S.W.R. Urie 4-6-0 engine were the guests of Murphy Radio Ltd., Welwyn Garden City, on a recent Sports Day. The photograph shows the engine being prepared for running

Sutton Coldfield and North Birmingham M.E.S.

Our meeting place has now been changed from the Yenton Hotel to the "Swan," High Street, Erdington, and visitors and new members are welcome to any of the meetings appended below. All meetings at 8 p.m.

At a recent meeting, congratulations were given to members F. A. A. Pariser and E. Field on their recent awards at the "M.E." Exhibition.

We shall not be having an exhibition this year, but we are looking forward to one next year. Membership continues to be strong, and we are getting good attendances at the meetings.

Programme:—

Oct. 5th.—Auction sale.
Oct. 19th.—"Fairground Steam Engines," B. Howell.
Nov. 2nd.—Bits and pieces. (Ladies invited.)
Nov. 16th.—Talk by J. James.
Nov. 30th.—Film night.
Dec. 14th.—Social evening.
Jan. 11th.—"The Lathe (but not for turning)." C. F. Palmer.

In addition, we have a trip to Swindon Works fixed for Sunday, October 10th, and our annual dance at the Church House, Erdington, on Saturday, October 30th.

Hon. Secretary: J. Revill, 75, Churchill Road, Bordesley Green, Birmingham, 9.

THE MODEL ENGINEER DIARY

September 30th, October 1st and 2nd.—Southport Model and Engineering Club.—Exhibition in the Chapel Street Congregational Schoolroom.

September 30th, October 1st and 2nd.—North London Society of Model Engineers.—Exhibition at Ewen Hall, Wood Street, Barnet.

October 11th to 23rd inclusive.—Tyneside Society of Model and Experimental Engineers.—Exhibition at The Chronicle Hall, Newcastle-upon-Tyne.

October 19th, 20th, 21st, 22nd and 23rd.—Grimsby & District Society of Model and Experimental Engineers.—Bi-annual exhibition at the St. Aidans Church Hall, Grimsby.

October 27th, 28th, 29th, 30th.—Trowbridge and District Society of Model Engineers.—Annual exhibition at St. James' Hall, Union St., Trowbridge. Open from 10 a.m. to 10 p.m. daily.

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WORKSHOP EQUIPMENT

Buck & Ryan for Lathes and Accessories, drilling machines, grinders, electric tools, surface plates, etc.—310-312, Euston Road, London, N.W.1. Phone Euston 4661.

New (Slightly Soiled) 2½″ 3-jaw (reversible) scroll chucks (model 32) Burnerd, reduced from £5 8s. to £3 10s. (1s. 9d. p. and p.). List supplied on request.—JOHN MORRIS (CLERKENWELL) LTD., 64, Clerkenwell Road, E.C.1.

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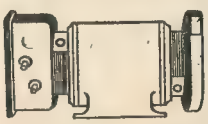

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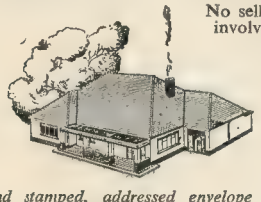

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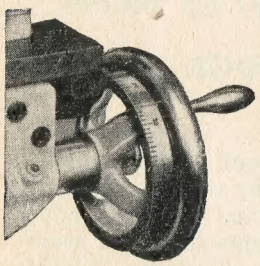

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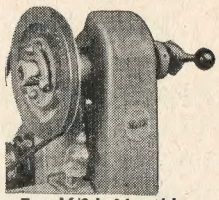

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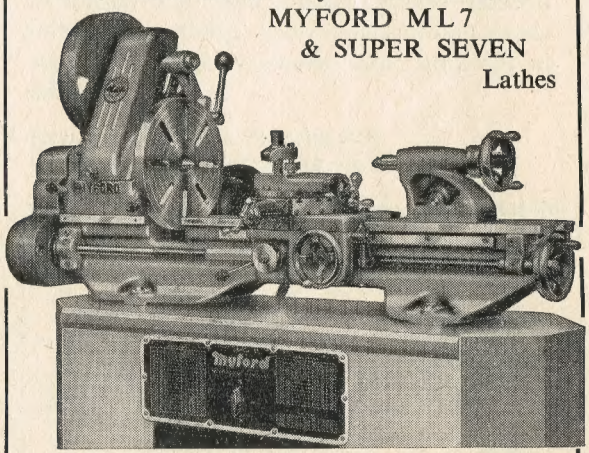

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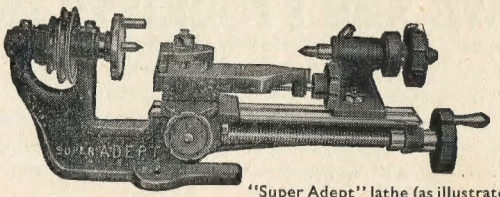

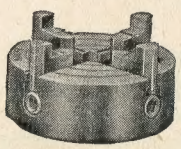

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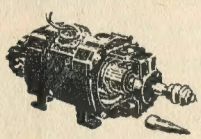

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19-20, NOEL STREET, LONDON, W.I..

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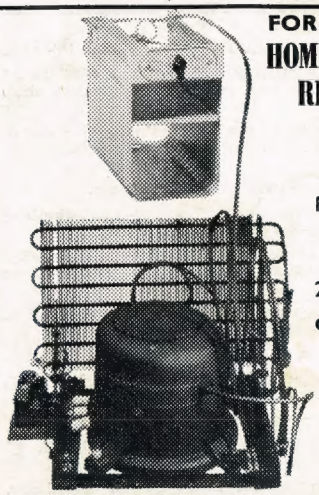

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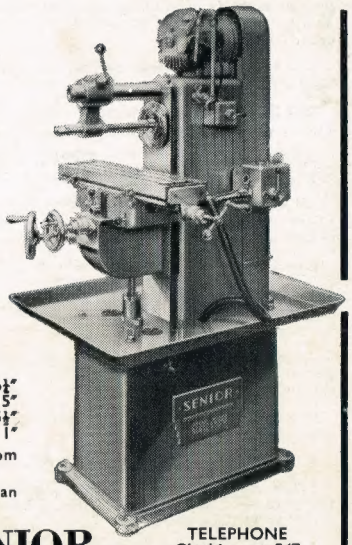

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